



USER'S MANUAL

OAM Application

for

MobiLink ISDN 2 GSM

VOXELL ISDN

Version 1.32 / Oct.2010

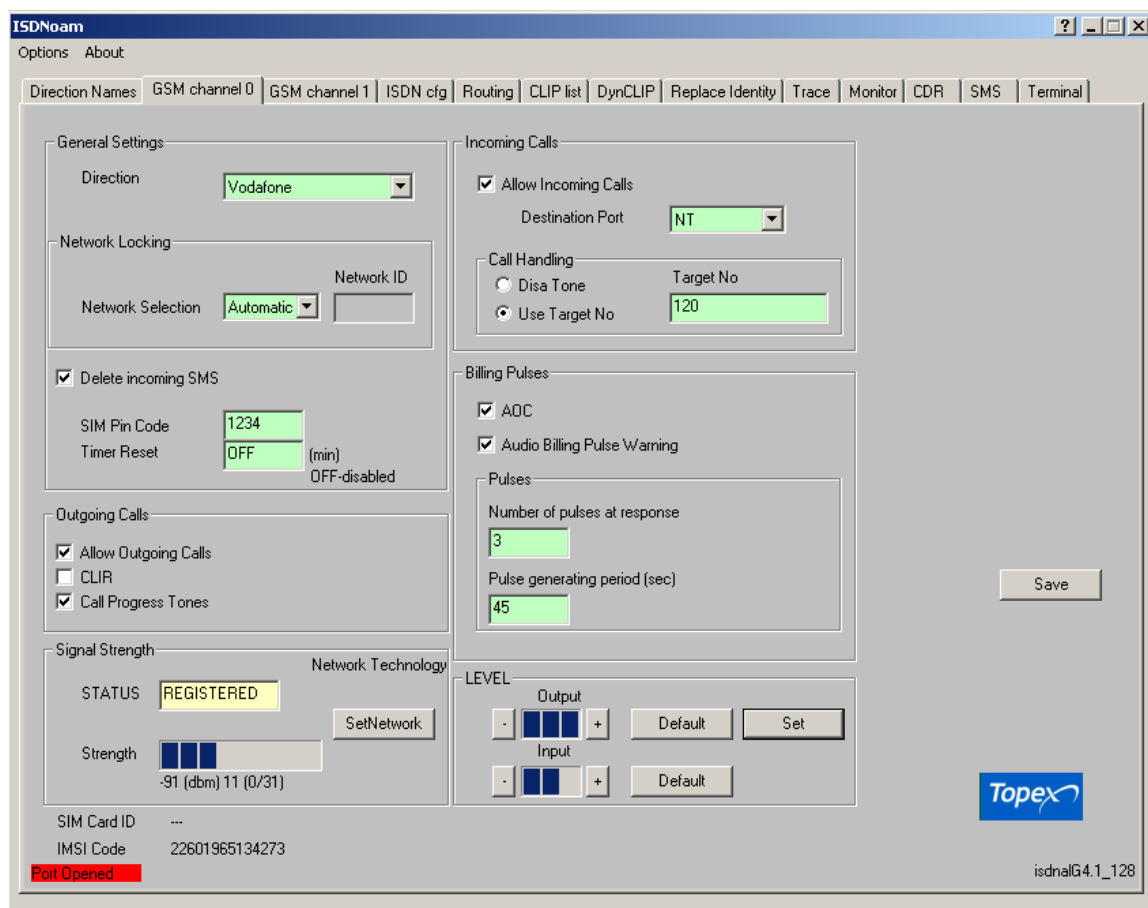
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OAM program for MobiLink ISDN 2 GSM VOXELL ISDN

(Operation, Administration and Maintenance)



ISDNoam.exe software version 1.32

TOPEX brief presentation

TOPEX is a group of Romanian companies, founded in 1990, by 10 enthusiastic engineers experienced in telecommunications. Its activity is directed to the research, development and production of telecom equipment as well as service for them.

TOPEX becomes very quick the most important supplier of IT&C solutions for small to large companies as well as for telecommunications operators and providers in Romania. The company designs equipment for all existing mobile systems (GSM, CDMA), including 3G technology.

TOPEX is represented all over Romania by a wide network of local distributors through which the promotion, administration and product maintenance are running.

Due to our innovation power, authentic flexibility, real respect for our partners and secure solutions that we provide TOPEX extended its business worldwide. Currently TOPEX delivers its products through its distributors to: Republic of Moldova, Bulgaria, Greece, Spain, France, Nigeria, Russia, UK, Turcia, Olanda, etc.

In order to achieve effective and flawless manufacturing for its products, TOPEX has carefully organized its Research and Development Department along with its production facility. This allows TOPEX to have maximum control of all the processes involved in the complex operations related to high-technology electronic manufacturing. At the present time, the Research and Development Department counts 30 specialists and the trend is ascending.

TOPEX's also considered the training and the service as part of the solutions it provides. Therefore, comprehensive trainings are organized at Topex Factory, complimentary for the company's clients. Service is also provided via internet, as all Topex solutions are designed especially to allow this, at the lowest cost.

TOPEX has implemented the quality management system according ISO9001 standard certified by SRAC since 1997, respectively by IQNET since 2002. TOPEX become a sector member of I.T.U. (International Telecommunication Union) since 2001.

For more details please visit www.topex.ro

1 PRODUCT HARDWARE DESCRIPTION

TOPEX ISDN gateway achieves a direct link between the ISDN phone exchange in your office and the wireless phone network. Consequently, it is easier to connect and the costs of fixed-to-mobile calls will be cut down by as much as 60%. You will avoid telephone fees for the interconnection between GSM network and the PSTN carrier. Also, calls coming from the cell phones of your personnel out in the field will be cheaper as well.

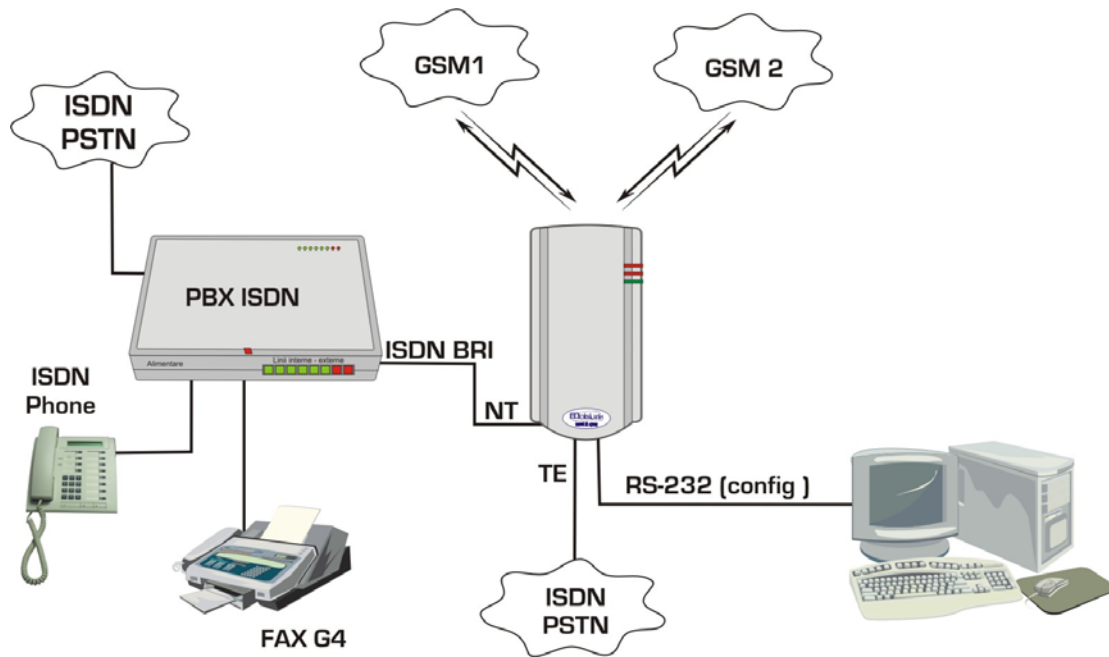


Figure 1. TOPEX ISDN gateway interconnection

2 GENERAL DESCRIPTION OF OAM APPLICATION

2.1 Introduction

TOPEX ISDN gateway is a digital mobile phone interface that uses 2G/3G internal modules for voice communications and SMS transmissions. It is connected to an ISDN PABX via NT and TE ports, or to the public ISDN network. The TOPEX ISDN gateway may afterwards be accessed from every local extension of the phone exchange. Also, each local subscriber connected to the PABX can be reached from GSM mobile phones in the field at the most favorable mobile phone tariff via the TOPEX ISDN gateway interface. Moreover, it performs call-back operation.

The TOPEX ISDN gateway may be configured efficiently and user-friendly by means of the OAM program "ISDNoam", which runs as a Windows application. The program is also used to store on your PC the billing files, to save / reload configuration parameters, or to upload a new firmware to the Topex box.

This document includes information on installation, configuration, and usage of the OAM program.

Topex reserves the right to make technical changes that serve the safety of the device and improve its operation.

2.2 Installing the program

This OAM program is intended for the configuration and administration of the TOPEX ISDN gateway equipment via serial port. Also, the program allows you to send and receive SMS messages from the computer that is connected to the equipment.

The serial connection is made by means of the special serial cable (which supplied in the TOPEX ISDN2GSM package).

This cable features a RJ-11 connector for connection to the TOPEX ISDN 2 GSM unit and a standard DB-9 connector for the COM port of the desktop PC or notebook computer you use to configure and administrate the equipment.



The installation CD or diskette supplied with the equipment includes the OAM (Operation, Administration, and Maintenance) software and the user manual in electronic format.

The **ISDNoam.exe** program is a self-contained Win 32 executable and may run on any desktop PC or laptop that does fulfill the following minimal requirements:

- Operating system: Windows 98 or later versions
- Minimum processor 486

- RECOMMENDED MINIMUM 500 MB FREE SPACE ON HDD

- Minimum 256 MB of RAM
- One serial R-S232 port free (available for the connection)
- Graphics resolution 1024 by 768 pixels - colors High Color (16bit) or True Color (32bit)

The OAM program does not require a special installation; you simply copy it to a location of your HDD. Just insert the diskette or CD into the respective disk drive unit and copy the structure of folders and files to your hard disk drive.

Then run the file **ISDNoam.EXE** from the directory on your hard disk.

This is the recommended procedure.

But even if you have copied only the executable application, upon first run, it will create the required auxiliary files and sub-folders for the configuration, billing and log files: **CONFIG**, **OUT**, **SAVED**.

Name	Size	Type	Date Modified
CONFIG		File Folder	16.04.2009 12:48
OUT		File Folder	14.04.2009 17:11
SAVED		File Folder	13.04.2009 11:13
analyzerLOG	16 KB	File	06.04.2009 17:28
apel-test	3 KB	File	08.04.2009 12:39
full-log	62 KB	File	25.03.2009 15:19
isdn.log	7 KB	Text Document	15.04.2009 10:02
logtrace3	3 KB	File	01.04.2009 11:22
mainrect.dat	1 KB	Video CD Movie	16.04.2009 12:52
TopexISDNoam.exe	540 KB	Application	01.04.2009 17:43
trace-ambele	8 KB	File	02.04.2009 17:41
xemnira	50 KB	File	19.03.2009 18:10

In these directories the OAM program will store all configuration files, files with information about billing, SMS sent and received, settings, saved configurations, and "trace" debug information.

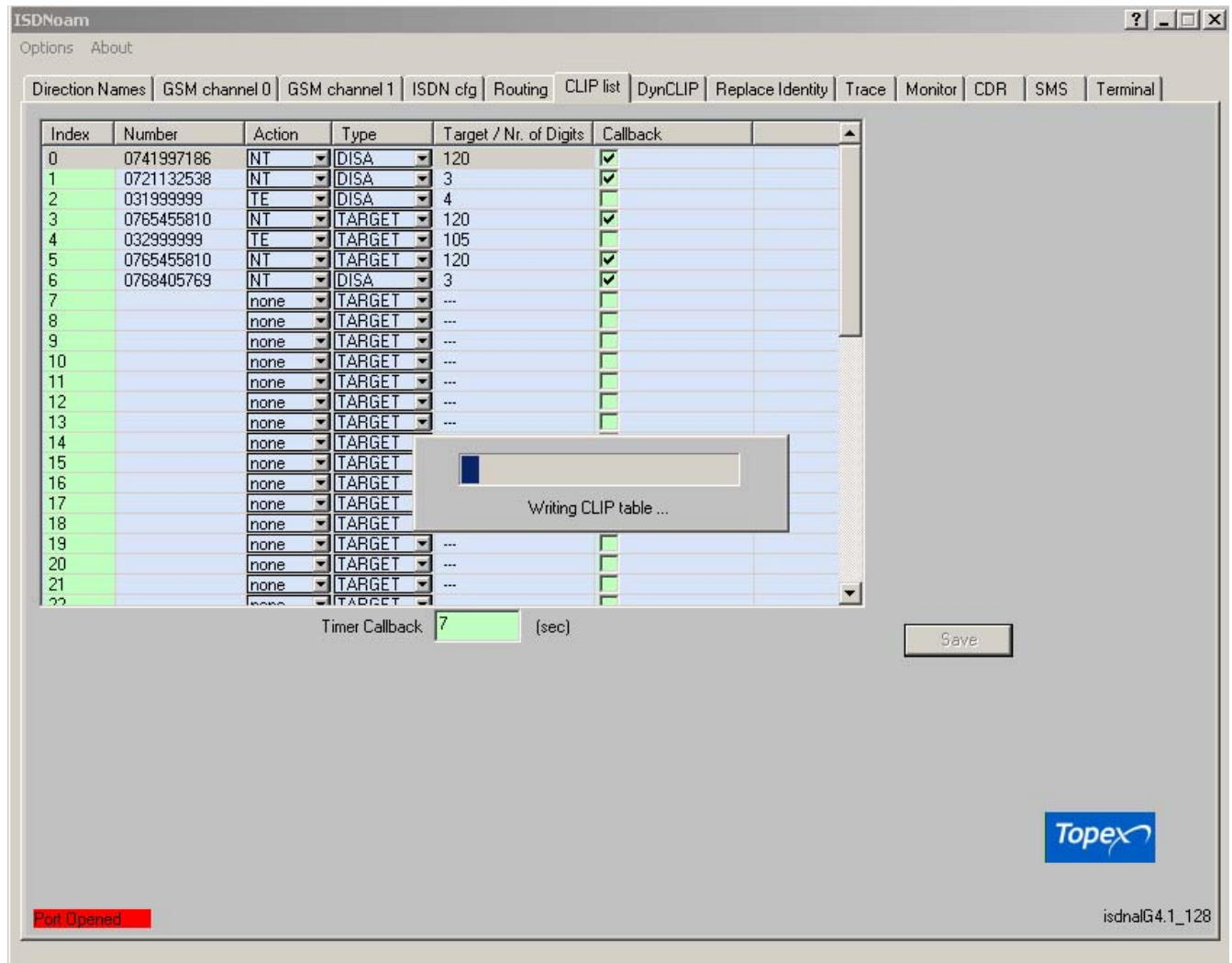
The **Topex ISDNoam.exe** application can now be executed, either from this directory directly or via a shortcut symbolic link that can be created manually e.g. on the desktop as shown in this example:



3 Configuration of the TOPEX ISDN gateway

The Topex equipment is configured and managed with the aid of the ISDNoam.exe application. After starting the application, by double-clicking on the icon of the application and achieving a successful connection to the TOPEX ISDN gateway, the main window of the OAM program opens up.

On top it shows tabs for "file cards" corresponding to different function groups. When you click on a tab, the corresponding "file card" opens up, such as the Routing screen shown below in the middle of a saving operation:



The tabs are arranged on the menu bar in a logical order, for an ergonomic, easy to use configuration. You may go easily from one tab to the next, or to a different one. These file cards corresponding to configuration screens are, from left to right:

- **Direction Names**, lets you assign meaningful names for the directions and define overflow (forwarding of calls in case of congestion);
- **GSM channel 0 and respectively GSM channel 1**, sets up the mobile interfaces of the device. It shows current information about subscriber card and GSM module and lets you configure all parameters related to the respective mobile network;

- **ISDN-cfg**, configuration of the ISDN interfaces (NT and TE ports);
- **Routing**, where you define the rules for routing of the outgoing calls;
- **CLIP list**, a list of callback or forwarding operation for the incoming calls, including all settings for different modes of call-back operations;
 - **DynCLIP**, complementary dynamic list with automatic CLIP for call forwarding and call-back service;
 - **Replace Identity**, may replace for certain prefixes the first digits of the ID with compatible values;
- **Trace**, advanced log / debug files recording the data transfers over the NT and TE ports of the ISDN interface;
- **Monitor**, Live Monitoring of the calls made through the TOPEX ISDN gateway, for checking and debugging;
- **CDR**, Call detail records, detailed listing of the durations of calls performed, for billing purposes;
- **SMS**, for sending and receiving SMS messages and archiving the received messages;
- **Terminal**, direct connection to the GSM modules for sending AT commands and following the response to these commands.

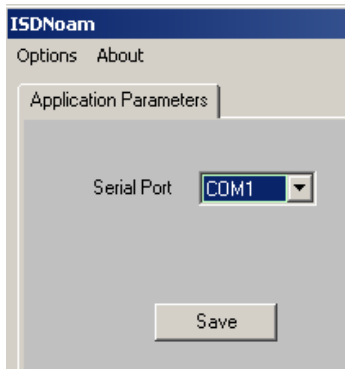
***Warning:** in the following pages you will see concrete examples of settings (telephone numbers, mobile carriers, codes, and so on) than have worked for Romania.*

Please remember that the direction names, operator names, phone numbers, the caller identities, local extensions, IMSI codes and other values used in this manual are for example purposes only;

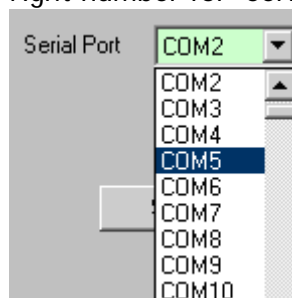
4 CONNECTION

To achieve a connection between the OAM program running on your computer and the TOPEX ISDN gateway, you must perform these steps:

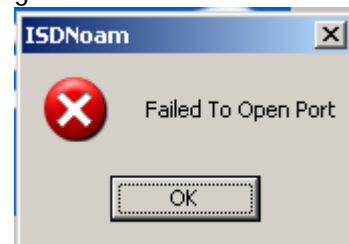
1. After calling up the application **ISDNoam.exe**, first go to the Application Parameters tab and set correctly the number of the serial port to be used for the data link to the OAM application (same with the physically port on which is installed the equipment):



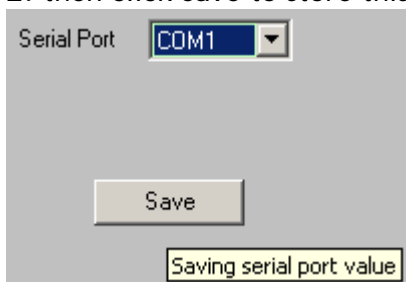
This is a drop down list box, you just select from it the right number for "Serial port"



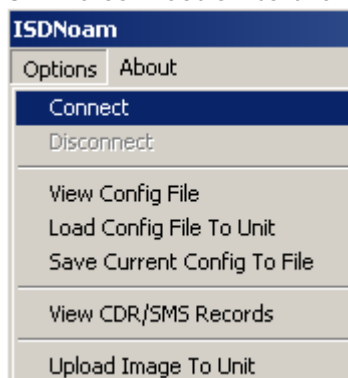
If you select incorrectly the serial port, upon first connection attempt you will get this error message:



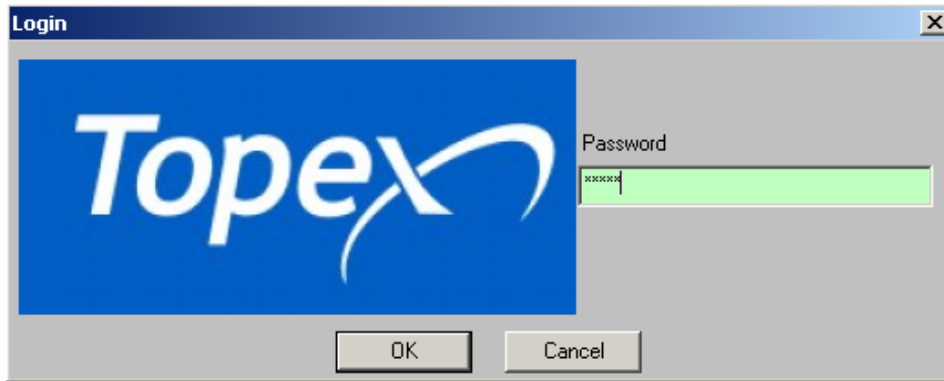
2. then click Save to store this value into



3. The connection to the Topex device is done by means of the "Options" tab:



4. The program asks you for the access password. The default password is **"topex"**:

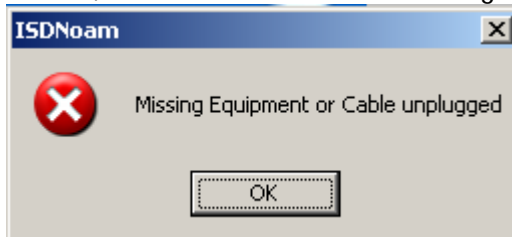


- of course, if you type the password incorrectly, you will get an error message:



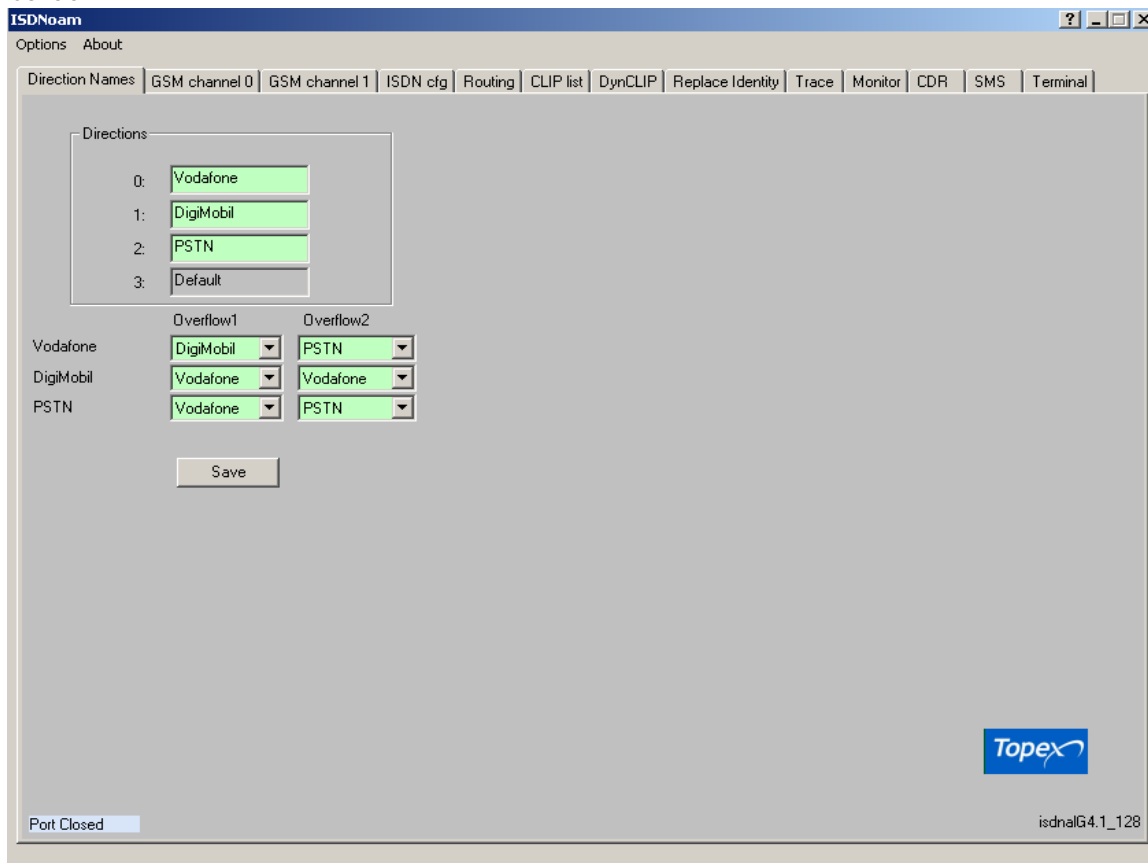
Try again, more carefully!

- if the port is correct, but the OAM application cannot find a connected TOPEX ISDN gateway device, it will issue this error message:

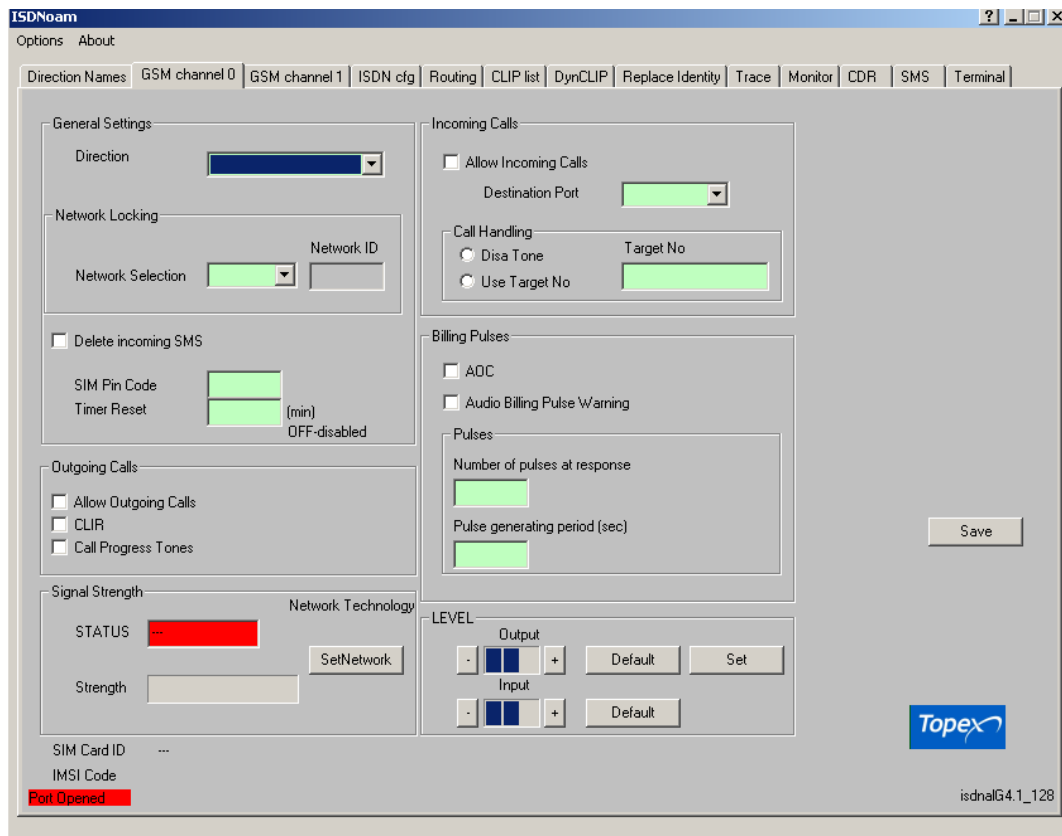


This can happen in several cases: missing or defective serial cable, no equipment is detected; the TOPEX ISDN gateway is not powered up, etc.

5. after successful log-in, the first tab of the menu bar, "Direction Names", will open up on your screen:



If you want to go to another file tab, for instance **GSM channel 0**, just click the corresponding tab and the respective file will come to the foreground and its contents will be shown on the screen:



As you notice in the picture above, at first the field STATUS is colored in red, and information in most or all fields is missing.

This is not an error, it happens because the program is just reading the state of the respective module.

After a few seconds the information from the GSM module are gathered, so the current values and settings will be shown on your screen:

Direction Names	GSM channel 0	GSM channel 1	ISDN cfg	Routing	CLIP list	DynCLIP	Replace Identity	Trace	M
<div>General Settings</div> <div> Direction: Vodafone </div> <div> Network Locking <div> Network Selection: Automatic </div> <div> Network ID: <input type="text"/> </div> </div> <div> <input type="checkbox"/> Delete incoming SMS </div> <div> SIM Pin Code: 1234 </div> <div> Timer Reset: OFF (min) <div> OFF-disabled </div> </div> <div> STATUS: ALERT </div> <div> Strength: ■ ■ ■ ■ </div> <div> -85 (dbm) 14 (0/31) </div>									
<div>Incoming Calls</div> <div> <input checked="" type="checkbox"/> Allow Incoming Calls <div> Destination Port: NT </div> </div> <div> Call Handling <div> <input type="radio"/> Disa Tone <div> Target No: 120 </div> </div> <div> <input checked="" type="radio"/> Use Target No </div> </div> <div> Billing Pulses <div> <input checked="" type="checkbox"/> AOC </div> </div> <div> Pulses <div> Number of pulses at response: 3 </div> <div> Pulse generating period (sec): 45 </div> </div> <div> LEVEL <div> Output: - <input type="text"/> + Default Set </div> <div> Input: - <input type="text"/> + Default </div> </div>									

This value is used in the situation that the PIN code is required by the SIM.

5 CONNECTION STATE

To summarize, the OAM program can be in one of these three states of connection to a Topex box

- **Online**, the program is actually connected to the TOPEX ISDN gateway.

The state of the serial port, indicated at the bottom, can be either **Closed** - meaning the program is not exchanging information or data with the Topex equipment or **Opened** - when the program interrogates the equipment:

The screenshot displays the TOPEX ISDN gateway configuration interface. At the top, there are tabs for 'Direction Names', 'GSM channel 0', 'GSM channel 1', and 'ISDN'. The 'Direction Names' tab is active, showing a list of directions (0: Vodafone, 1: Cosmote, 2: PSTN, 3: Default) and overflow settings for each. Below this is a 'Save' button. The 'Port Closed' status is indicated at the bottom left. The 'Network Selection' is set to 'Automatic'. The 'Delete incoming SMS' checkbox is unchecked. The 'SIM Pin Code' is 1234, and the 'Timer Reset' is OFF. The 'Outgoing Calls' section shows 'Allow Outgoing Calls' checked, 'CLIR' unchecked, and 'Call Progress Tones' checked. The 'Signal Strength' section shows the status as 'REGISTERED' and the strength as -65 (dbm) 24 (0/31). The 'Network Technology' is set to 'EDGE', and the 'SetNetwork' button is visible. The 'Billing Pulses' section shows 'AOC' and 'Audio Billing Pulse' checked. The 'Pulses' section shows 'Number of pulses at' set to 3 and 'Pulse generating per' set to 29. The 'LEVEL' section shows 'Output' and 'Input' levels with '+' and '-' buttons. The 'SIM Card ID' is ---, and the 'IMSI Code' is 22610241004320. The 'Port Opened' status is indicated at the bottom left.

Direction Names | GSM channel 0 | GSM channel 1 | ISDN

Directions

0: Vodafone

1: Cosmote

2: PSTN

3: Default

Overflow1 Overflow2

Vodafone Cosmote PSTN

Cosmote Cosmote Vodafone

PSTN Vodafone Cosmote

Save

Port Closed

Network Selection Automatic

☐ Delete incoming SMS

SIM Pin Code 1234

Timer Reset OFF (min) OFF-disabled

Outgoing Calls

☒ Allow Outgoing Calls

☐ CLIR

☒ Call Progress Tones

Signal Strength

STATUS REGISTERED

Strength -65 (dbm) 24 (0/31)

Network Technology EDGE

SetNetwork

Billing Pulses

☒ AOC

☒ Audio Billing Pulse

Pulses

Number of pulses at 3

Pulse generating per 29

LEVEL

Output

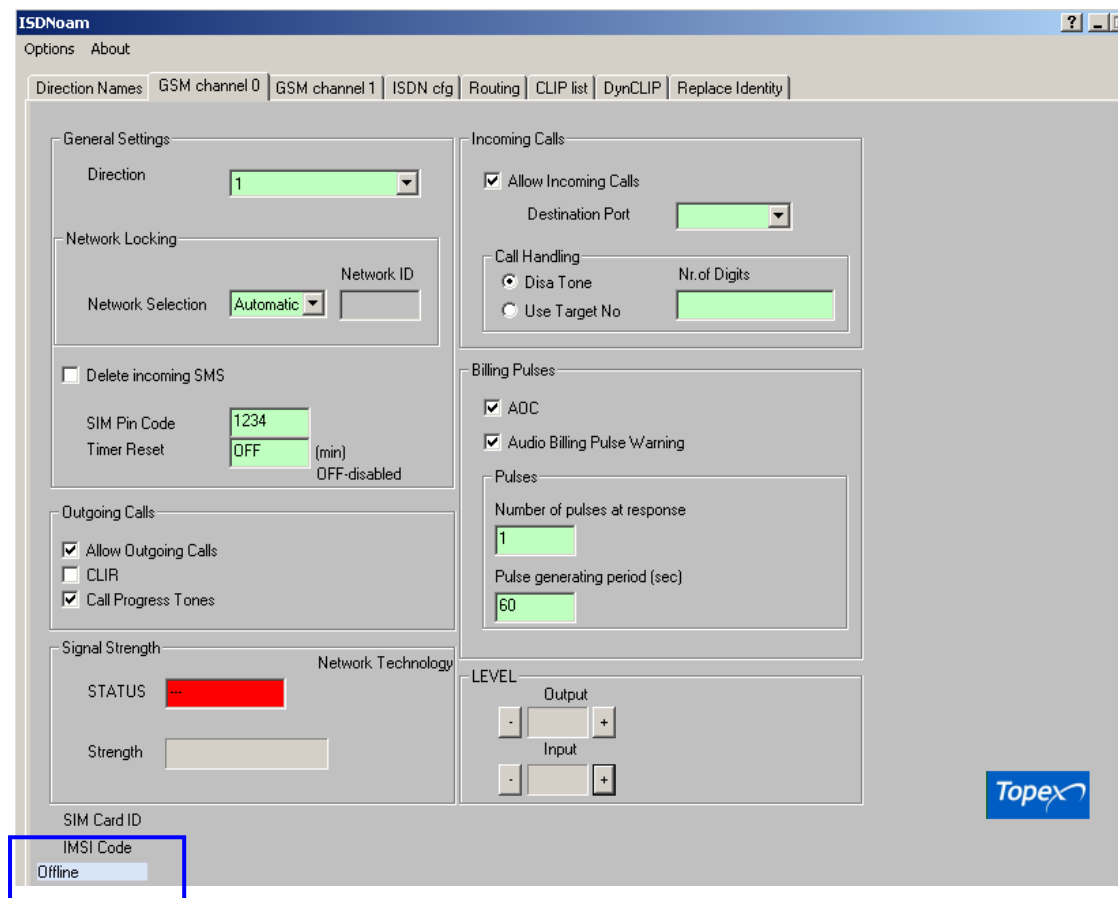
Input

SIM Card ID ---

IMSI Code 22610241004320

Port Opened

- **Offline**, when no equipment is connected, but you may use the OAM program to see a saved configuration, to perform Save or Load, to upload a new firmware image, or to see the Call Detail records or the SMS messages sent and received by means of the Topex box:



Listing of SMS sent or received via ISDN gateway, while the equipment is not connected (Offline):

ISDNoam

Options About

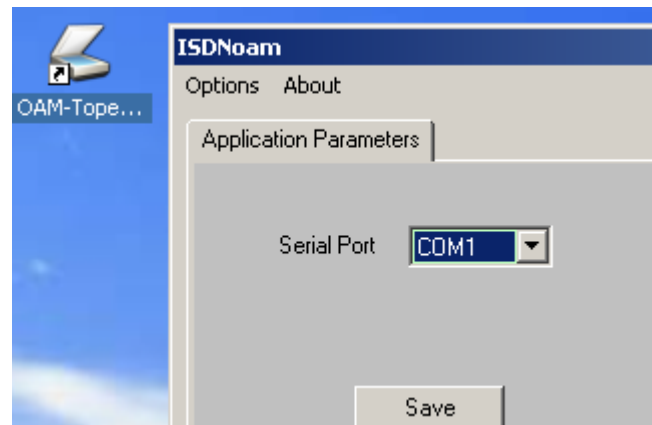
CDR SMS

SIM	Type	Number	Status	Time	Text
GSM0	Output	0757283...	SENT	09/05/07,11:45:22	another test for
GSM1	Output	0757283...	SENT	09/05/07,11:45:33	another test for
GSM1	Output	0741664...	SENT	09/05/07,11:46:05	ai ajuns la serv
GSM0	Output	0741664...	SENT	09/05/07,11:46:17	ai ajuns la serv
GSM0	Output	0724255...	SENT	09/05/07,11:47:27	next TGE key is
GSM0	Input	+407242...	RECEIVED	09/05/07,11:47:25+12	next TGE key is
GSM0	Output	0724255...	SENT	09/05/07,11:58:44	this is a very lo
GSM0	Input	+407242...	RECEIVED	09/05/07,12:00:35	this is a very lo
GSM0	Output	0757283...	SENT	09/05/07,12:00:35	this is a very lo
GSM1	Input	+407242...	RECEIVED	09/05/06,15:08:06+12	testing transmiss
GSM1	Input	333	RECEIVED	09/05/06,17:50:13+12	Destinatie nepre
GSM1	Input	+407242...	RECEIVED	09/05/06,17:58:10+12	Hi Alexis! Take
GSM1	Input	+407572...	RECEIVED	09/05/06,17:58:36+12	Hi Alexis! Take
GSM1	Input	+407242...	RECEIVED	09/05/07,11:45:20+12	another test for
GSM1	Input	+407572...	RECEIVED	09/05/07,11:45:32+12	another test for
GSM1	Input	+407242...	RECEIVED	09/05/07,12:00:33+12	this is a very lo
GSM1	Input	7811111...	RECEIVED	09/05/07,12:40:20+12	Apeluri pierdute

6 DESCRIPTION OF OPTIONS

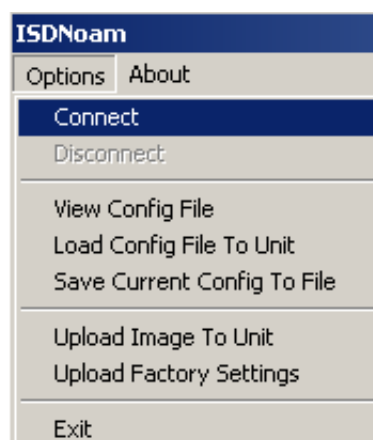
On top of the OAM screen you have the items „Options” and respectively „About”. The tab <<Application Parameters>> has a single item, „Serial Port”, used to change the number of the serial port where TOPEX ISDN gateway is connected.

This is not used very often, you just set the COM port at the beginning, and then you don't change it anymore.



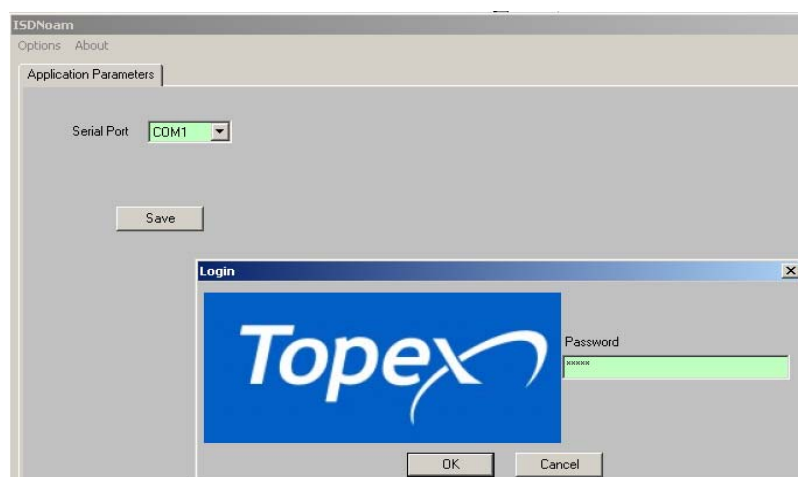
Options is by far the most important, since it allows access to many functions: **Connect** / **Disconnect**, **Save Config file** and **Load saved Configuration**, **View Config File** (offline), **Upload** a new firmware image to the TOPEX ISDN gateway unit, or **Restore Factory Default** settings for the Topex box.

Also, from this menu you can quit the OAM program with **Exit**.



6.1 Connect

Use this to connect with the OAM program to a Topex box. The program will ask you for the password:

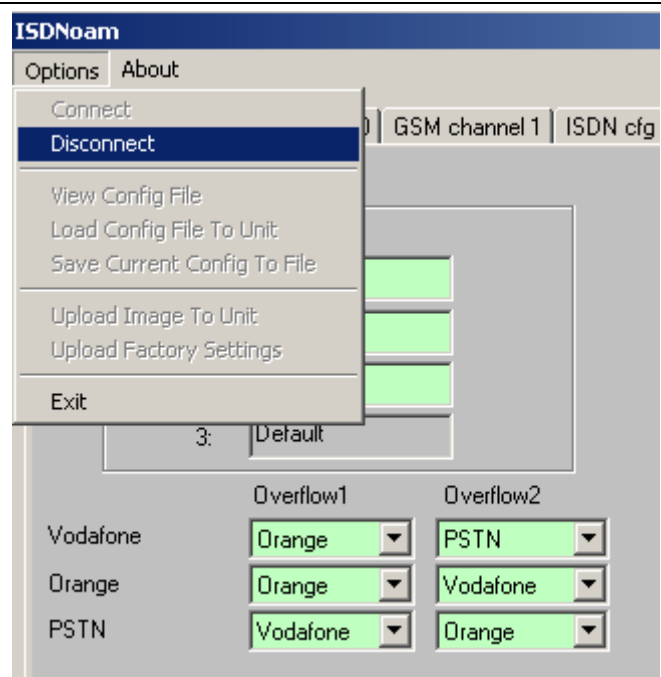


- the default password is „topex”

6.2 Disconnect

When you are connected to TOPEX ISDN gateway, the only item available in the menu "Options" is ... **Disconnect**..

This means that, if you want the Save or Load a configuration, to restore the factory default settings, or to upload a new firmware image, you must first perform a Disconnect from the current state.

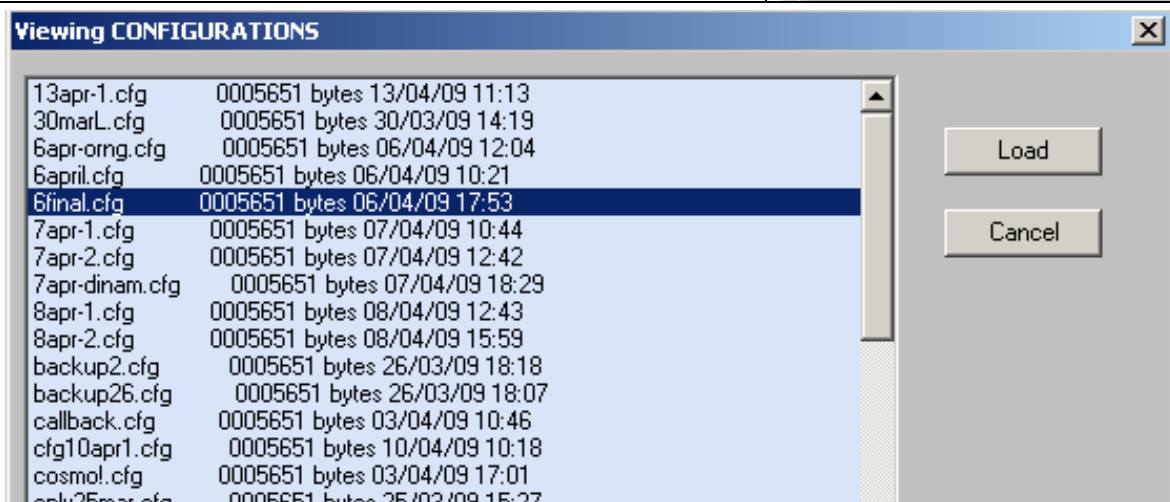
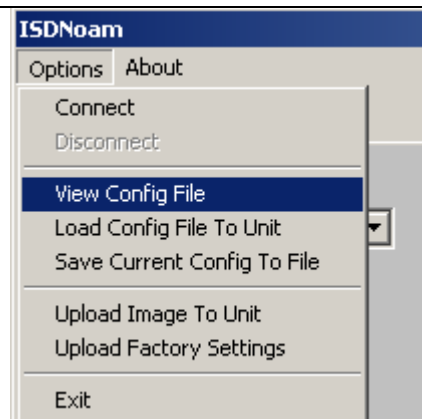


6.3 View Config File

You can use this option, in a disconnected state (as you can see, the option Connect is available, which means that you are NOT connected to MobiLink), to view a configuration file that you have saved previously.

Since you are not actually connected to the Topex box, you can only see the configuration, you cannot perform changes of the parameters, hence the name "View" for this option.

When you click "View Config File", the window <<Viewing CONFIGURATIONS>> shows up:



The “.cfg” files are listed with their names, length in bytes, and creation date (date + time). Select the one you want to load, then click the button “Load” to view this configuration:

The screenshot shows the ISDNoam configuration window with the following settings:

- General Settings:**
 - Direction: 2
 - Network Locking: Network Selection: Telstra, Network ID: 50501
 - ☐ Delete incoming SMS
 - SIM Pin Code: 9176
 - Timer Reset: 59 (min) OFF-disabled
- Incoming Calls:**
 - ☒ Allow Incoming Calls
 - Destination Port: [empty]
 - Call Handling: ☐ Disa Tone, ☒ Use Target No
 - Target No: 207
- Billing Pulses:**
 - ☐ AOC
 - ☒ Audio Billing Pulse Warning
 - Pulses:
 - Number of pulses at response: 2
 - Pulse generating period (sec): 55
- Outgoing Calls:**
 - ☒ Allow Outgoing Calls
 - ☐ CLIP
 - ☒ Call Progress Tones
- Signal Strength:**
 - STATUS: [Red bar]
 - Strength: [empty bar]
- LEVEL:**
 - Output: [empty]
 - Input: [empty]
- SIM Card ID:**
 - IMSI Code: [empty]
 - Status: Offline

The window also features a menu bar with "Options" and "About", and a tab bar with "Direction Names", "GSM channel 0", "GSM channel 1", "ISDN cfg", "Routing", "CLIP list", "DynCLIP", and "Replace Identity". The Topex logo and version "isdnaG4.1_128" are visible in the bottom right corner.

First of all, notice that not all the tabs for card files are present in the menu, only the first ones. See below for comparison the tabs menu in a Connected state:

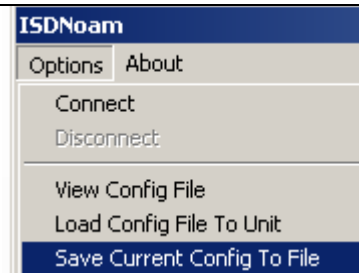
This screenshot shows the ISDNoam configuration window in a connected state. The menu bar includes "Options" and "About". The tab bar includes "Direction Names", "GSM channel 0", "GSM channel 1", "ISDN cfg", "Routing", "CLIP list", "DynCLIP", "Replace Identity", "Trace", "Monitor", "CDR", "SMS", and "Terminal". The status box at the bottom left shows "Online" on a light blue background.

Trace, Monitor, SMS, Terminal are not shown because they *cannot perform* in a disconnected (Off-line) state. This disconnected state is also indicated by the status box at the bottom left of the screen, which shows “Offline” on a light blue background, instead of the “Port open” or “Port closed” indication in a connected state.

Second, the “Save” button is missing from all the screens of the OAM program. This is because you can only **view** a configuration that has been saved previously, you **cannot** perform changes, and you are not allowed to modify the settings.

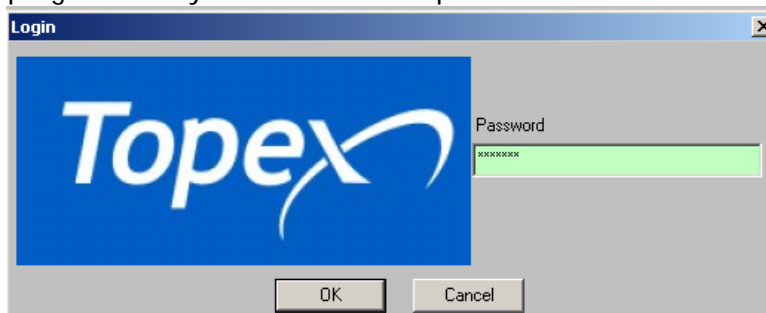
6.4 Saving and loading system configurations

There are two Menu options for saving and respectively loading configurations from / to the TOPEX ISDN gateway. Those functions are valid only in the situation when the OAM program is **not** in a state of connection with TOPEX ISDN Gateway. As you can see in the image to the right, the option Connect is available while Disconnect is disabled, this means you are **NOT** connected to the TOPEX ISDN gateway.

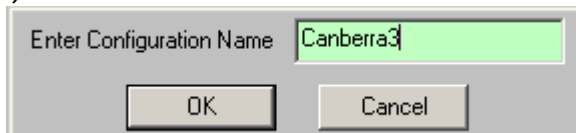


To save a configuration click the “Save Current Config To File” from the icon and the following dialog window shows up:

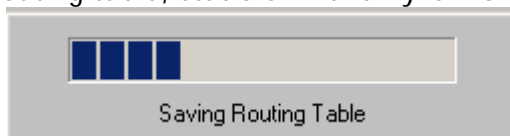
- first, the program asks you for the access password:



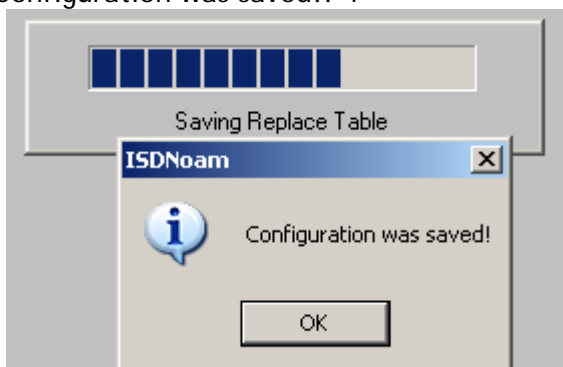
- if you typed the correct password, a window shows up asking you a NAME for the saved configuration, you should enter a meaningful name (relevant for the respective set of parameters):



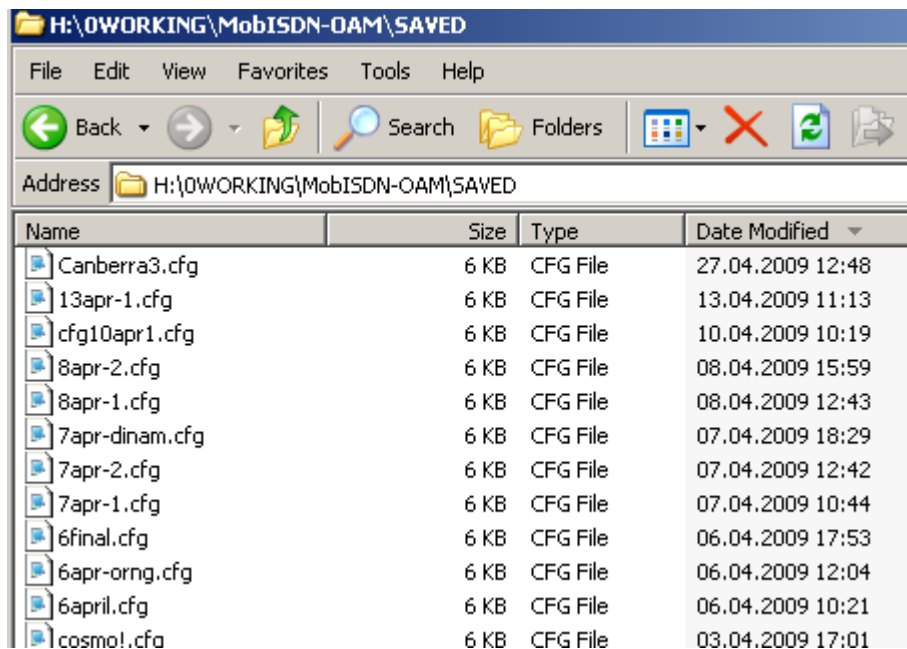
- the saving of the configuration begins, you will see a progress indicator for each item (GSM settings, Routing table, static CLIP and Dynamic LCIP, Replace table):



- after successful saving of all components, a confirmation message will be displays, telling you that the “Configuration was saved!!”:



- The saved configuration is located in the "SAVED" sub-directory of the folder were you have placed the OAM program:



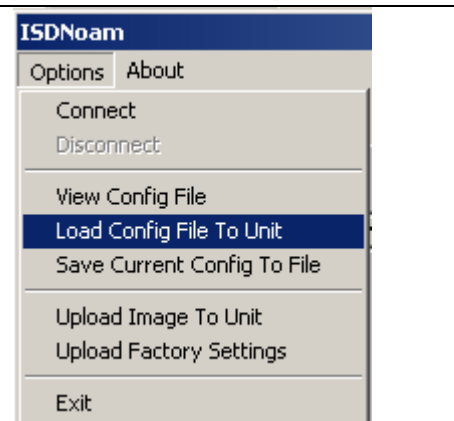
In this subfolder are located all the saved configurations (sets of parameters for TOPEX ISDN gateway ISDN). They are files with the ".cfg" extension that is added by the program to the name you have filled in.

The configuration contains the settings for directions assignment, PIN codes, level and network settings, targets, routing table, static and dynamic CLIP-GSM table and prefix replacement information..

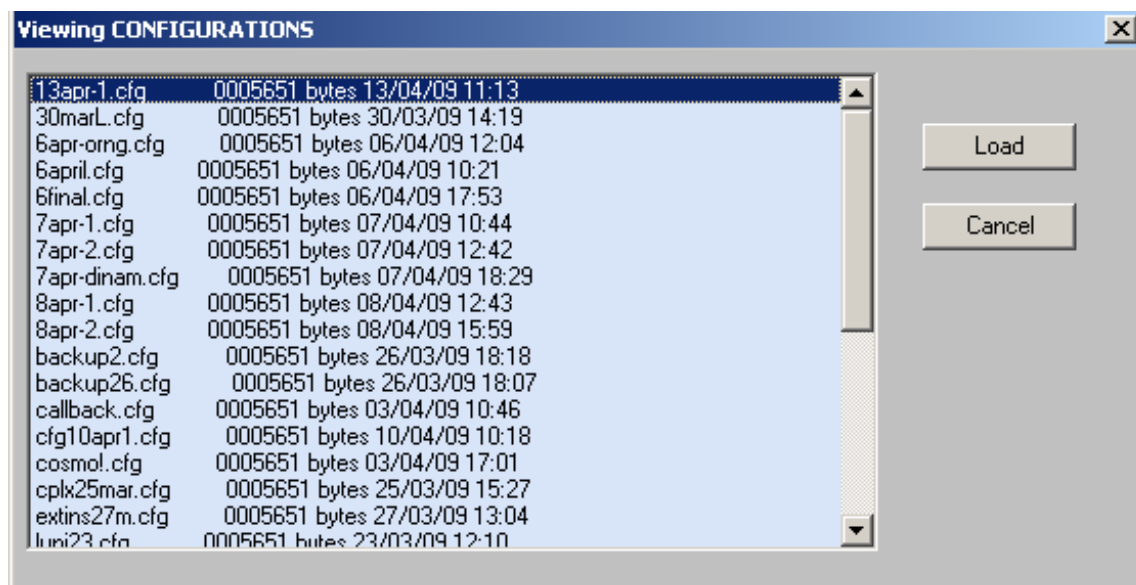
6.5 Load config

To restore a configuration that you have saved, that is to load the configuration file to the TOPEX ISDN box, the respective equipment must also be in a “disconnected” state. From the Menu Options, select “Load Config File to Unit”:

The OAM program asks you for the password.

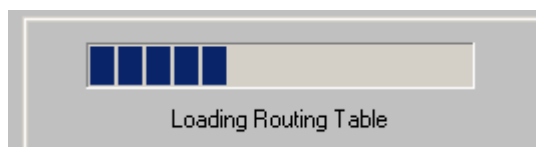


Enter the password “topeX”, then a list “Viewing Configurations” shows up:

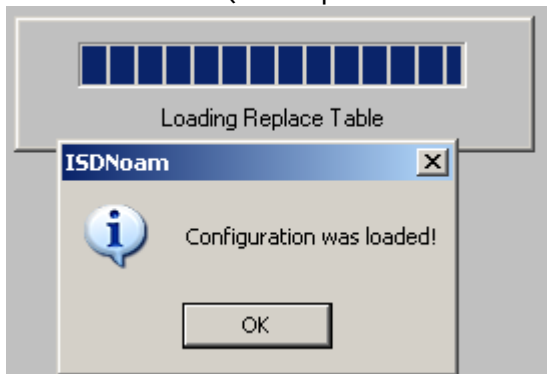


The list shows the names of the saved configuration files, their length in bytes, and the date and time of creation (date-month-year hour-minutes). Select from the list the configuration you want to restore then click the “Load” button.

The program begins loading the different components of the configuration to the TOPEX ISDN gateway unit. It displays the name of each item loaded, together with a progress bar:



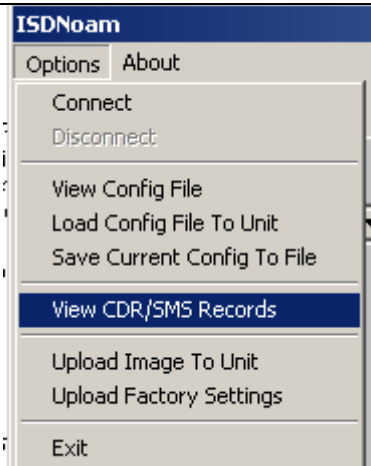
When it finishes (the Replace table is the last item), it shows you a success message:



Note: *It is strongly recommended that before loading a new image file, you save the current configuration, then load it again when TOPEX ISDN gateway operates with the new firmware. This way you are sure that all your settings will be kept.*

6.6 View CDR/SMS

Select this item from the Options menu to view the CDR records or stored SMS messages form an on-line (disconnected) state:



6.6.1 CDR option

By default, it opens to the first tab, CDR:

The screenshot shows the 'ISDNoam' application window with the 'Options' tab selected. The 'CDR' tab is active, displaying a table of call records. The table has the following columns: Time, Source, Ident, Destination, Number, Selection, and Speaking. The data is as follows:

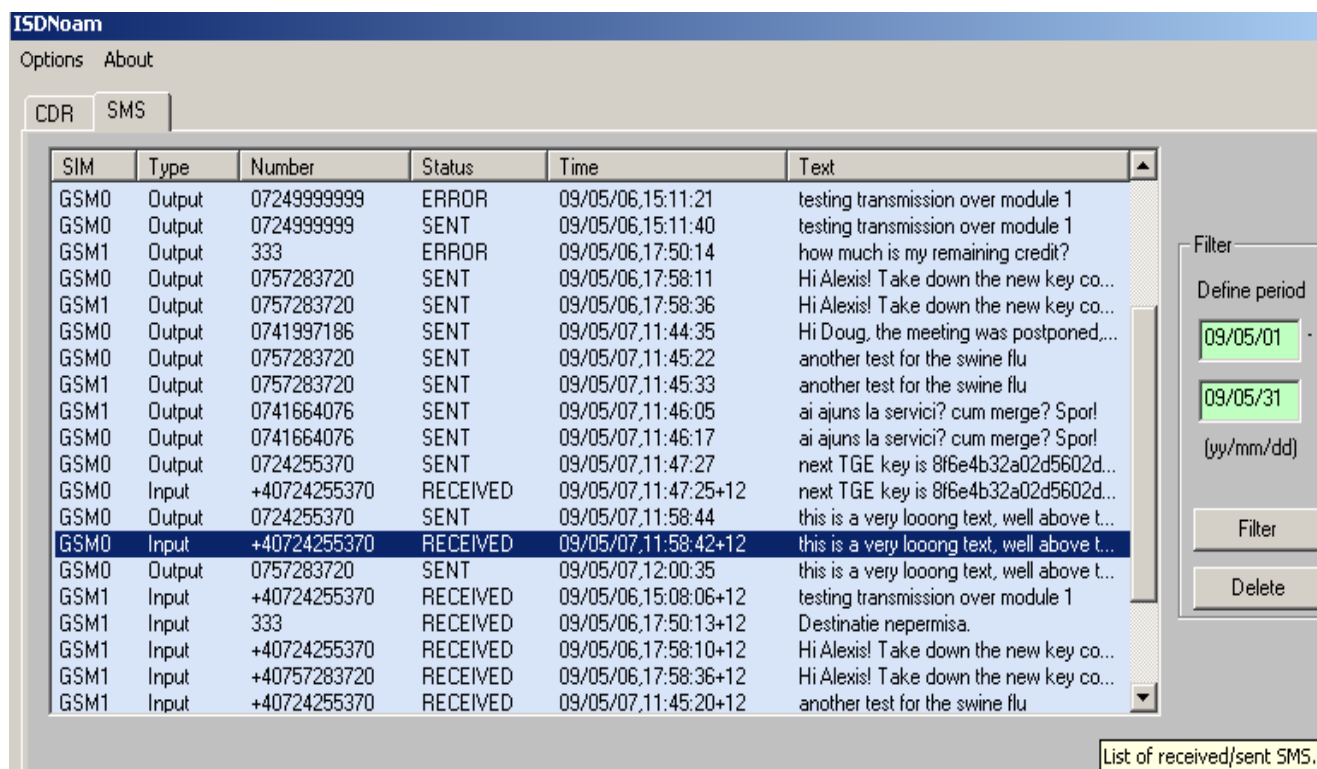
Time	Source	Ident	Destination	Number	Selection	Speaking
06-05-09,11:39:00	GSM1-cbd	0741997186	none		0	0
06-05-09,11:39:30	NT	120	TE	07419971...	30	0
06-05-09,13:46:02	NT	120	GSM0	07242553...	19	0
06-05-09,13:46:34	NT	120	TE	07419971...	27	0
06-05-09,13:47:16	NT	120	GSM0	07320562...	31	0
06-05-09,13:48:03	GSM0-cbt	0765455810	NT	120	7	0
07-05-09,11:23:49	NT	120	GSM0	07320562...	9	0
07-05-09,11:24:17	NT	120	TE	07419971...	28	0
07-05-09,11:24:44	NT	120	TE	02199999...	28	0
07-05-09,11:39:33	GSM0	0372705742	NT	120	10	863
07-05-09,11:39:39	NT	120	GSM0	07799999...	5	0
07-05-09,11:42:41	NT	120	GSM0	07320562...	10	0
07-05-09,11:42:55	NT	120	GSM0	07320562...	13	0
07-05-09,11:43:18	NT	120	TE	07419971...	22	0
07-05-09,12:01:23	NT	120	GSM0	07320562...	26	0
08-05-09,07:58:28	NT	120	none		2	0
08-05-09,08:26:47	NT	120	TE	07419722...	15	0
08-05-09,08:27:15	NT	120	TE	07419971...	30	0
08-05-09,15:56:47	NT	120	TE	07419971...	28	0
08-05-09,15:59:59	NT	120	GSM0	07320562...	16	0
08-05-09,16:00:29	NT	120	TE	08888888...	13	0
08-05-09,16:00:37	GSM0	0372705742	NT	120	9	7
08-05-09,16:03:19	GSM1	0740109531	NT	120	14	83
08-05-09,16:07:53	GSM0-cbt	0765455810	NT	120	10	238
08-05-09,16:09:38	NT	120	none		0	0
08-05-09,16:45:51	NT	120	GSM0	07320562...	16	22
08-05-09,16:46:31	GSM0-cbt	0765455810	NT	120	13	0
08-05-09,16:50:44	GSM0-cbt	0765455810	NT	120	11	197
08-05-09,16:51:00	NT	120	GSM0	07320562...	15	0
08-05-09,16:51:29	NT	120	TE	07419971...	28	0
08-05-09,16:51:50	NT	120	GSM0	07320562...	9	0
08-05-09,16:52:18	NT	120	TE	07419971...	28	0
08-05-09,16:53:56	NT	120	TE	21300000...	25	0
08-05-09,16:53:56	NT	120	none	0	2	0
08-05-09,16:54:25	NT	120	TE	07400000...	29	0
08-05-09,17:11:14	NT	120	TE	07419971...	26	0

At the bottom of the window, the status 'Port Closed' is displayed.

In this window you can see all the details about the calls that have been recorded previously. Notice at the bottom the indication "Port Closed", which shows you that the OAM program is Not communicating with a Topex equipment.

6.6.2 SMS - SEND AND RECEIVED

Click the tab SMS to see the text messages sent or received by means of the TOPEX ISDN gateway equipment:




You can use the scrollbar to the right to move up and down in the list of SMS messages, or you may define a certain period to filter out or to delete the saved text messages. Since the Topex box is not connected, you cannot transmit or receive messages, you can only see the ones already stored by the OAM program.

6.7 Upload image

This facility allows you to up-load to the Topex box a new software image, a version of the firmware application running on the TOPEX ISDN gateway system (to perform a firmware update).

Using the ISDNoam.exe application, a new version of the firmware can be transferred to the Topex box via the serial data link. Before you do this, first check the version of the firmware running on your device, to avoid uploading an older or incompatible software image:



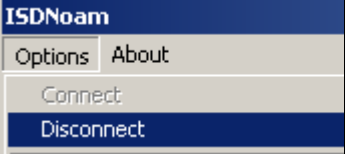
isdnaG4.1_128

The current version of the firmware used in TOPEX ISDN gateway is displayed, in a connected state, at the bottom right corner of the OAM screen, below the Topex logo, such as "isdnaG4.1_128":

Warning! *This is a two-step operation, because to find out the version, you must be in a state of connection between OAM and box, the bottom left indicator should show either the red indication "Port opened" or the blue "Port closed"*

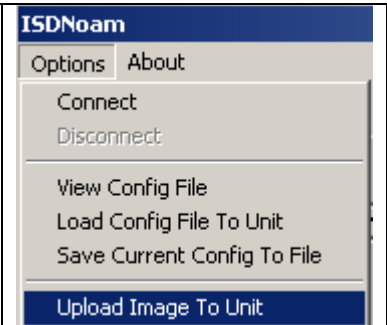
but afterwards, to actually load the image file, the program must be disconnected from the TOPEX ISDN gateway. Select Options>Disconnect, the serial port indicator will show "Offline"

: Offline

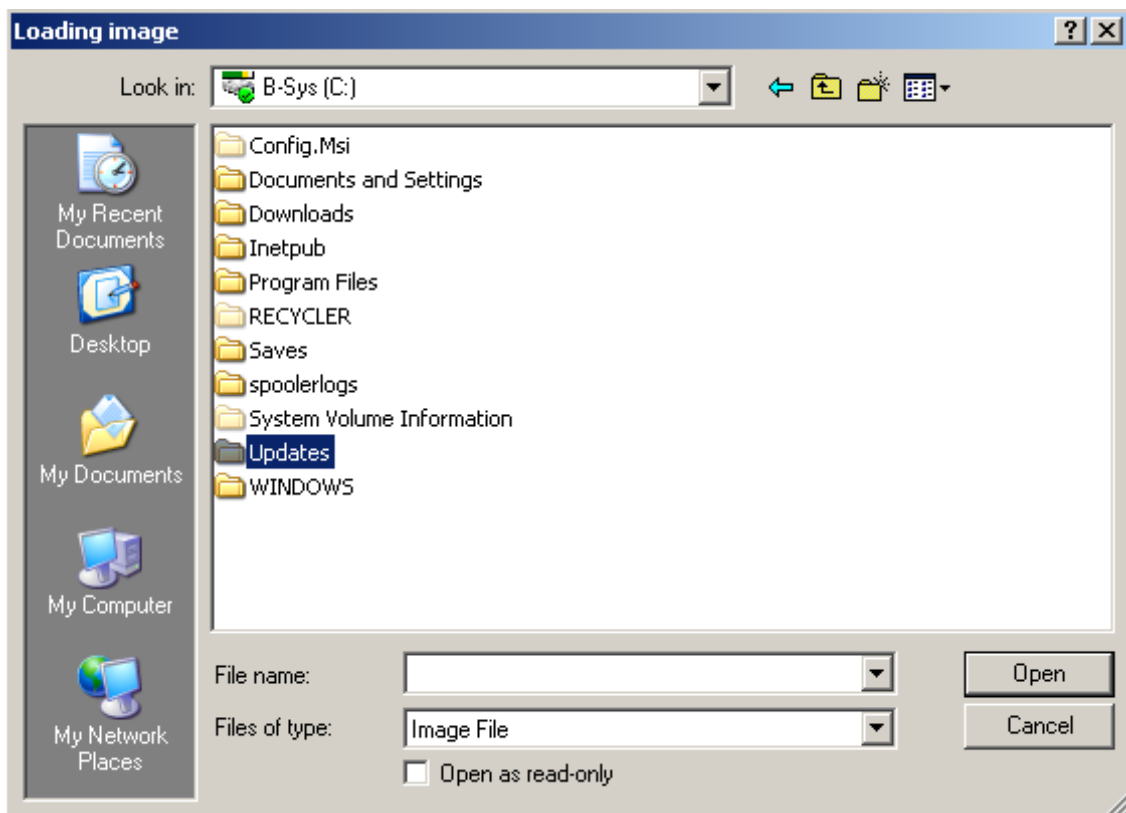


- then from the same Options menu, select **“Upload Image to Unit”**:

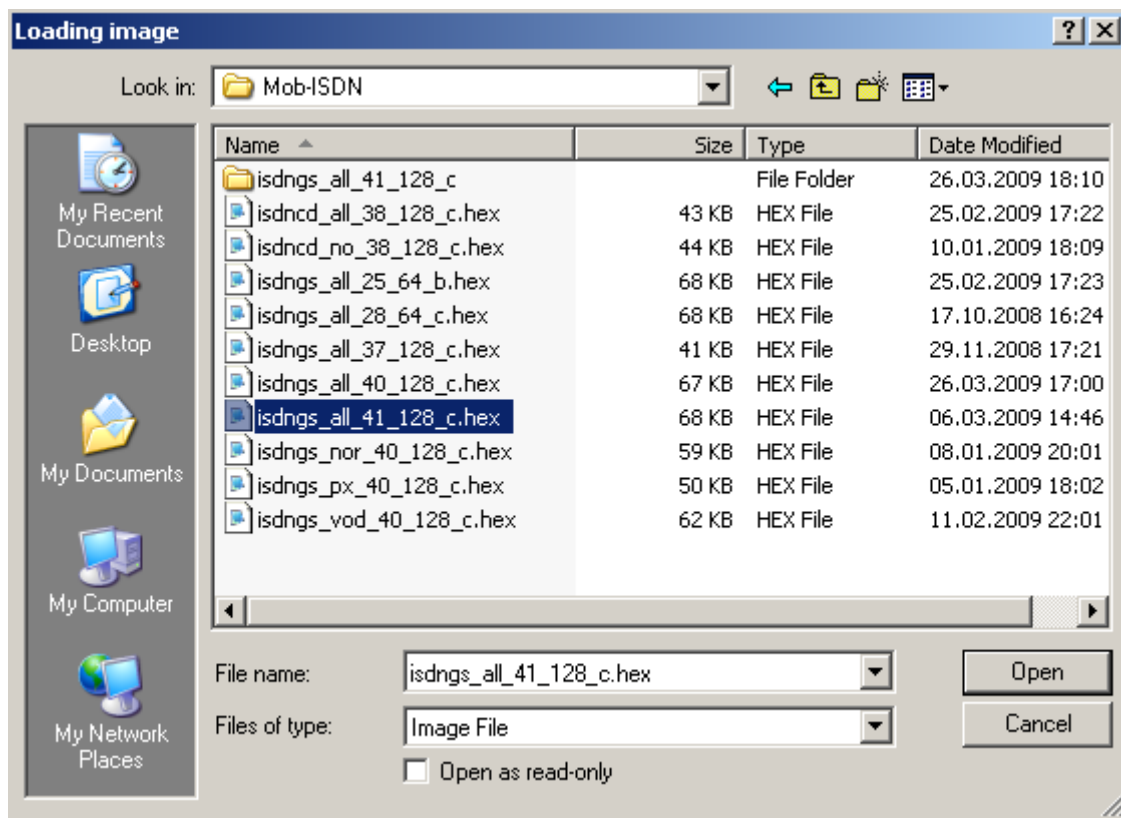
The program will display the normal Windows dialog for opening files, where default type is “image file”.



Go to the folder that stores the firmware images, such as “Updates” on the C: drive in this example



Open this folder, and from it select the “.hex” file that is to be transferred to the TOPEX ISDN gateway, such as isdngs_all_41_128_c.hex in this example:



By clicking on the “Open” button, the first OAM asks you for the password.

- if you type a wrong password, you will get an error message as shown:

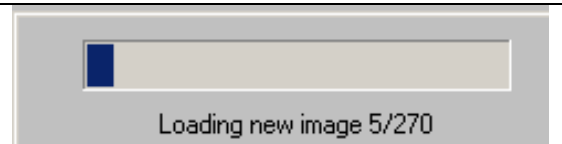


- if you have entered the correct password, the transfer of the firmware image file to the TOPEX ISDN gateway begins.

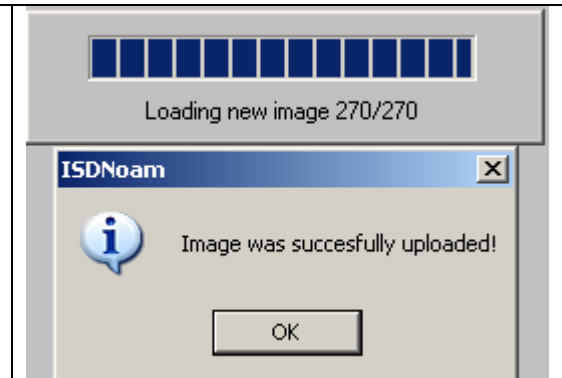
The new software image is divided in several successive packets which are sent to the TOPEX ISDN gateway via serial connection.

The reception of each packet must be confirmed by the equipment. As the software is uploaded, a progress bar shows the transfer of each packet.

The message displayed is "Loading new image xxx/yyy", where xxx is the number of the current package and yyy is the total number of packets of the file, such as 270 in the example to the right:



When it is finished, you see "270/270", meaning all packets have been transferred, and an additional message for confirmation of the successful up-loading of the new firmware:



- to ensure proper operation, the unit with the new firmware should be restarted, by performing a "Reset" - pull off the power supply jack then plug in back after 10 seconds.

- now you can connect again with the OMA program to the TOPEX ISDN gateway unit, which runs the new firmware.

Attention: The files to be loaded have the extension "hex". To avoid malfunctions, only files approved by TOPEX should be loaded into the device. The image files are available from the website of the TOPEX company.

In case of a power failure during reprogramming of the device or any other event that invalidates the program storage of the equipment, the unit could become non-operational. In this case you should call SERVICE to perform software repairs.

Important notices related to the loading of a new version of application software into TOPEX ISDN GATEWAY. *Be careful when you load an update file. If you select a wrong kind of file, or if for different reasons firmware upgrading fails, the TOPEX ISDN GATEWAY will no longer operate correctly. In some cases you will need to contact the manufacturer for repairs. To avoid this, follow carefully the rules indicated here:*

- **Always backup!**

Before loading of the image file (menu "Loading Image File") it is strongly recommended that you save the current configuration of your TOPEX ISDN GATEWAY unit. Click the icon "Save current configuration". Then, after you performed the loading of image file, reload the saved configuration by clicking the icon "Load configuration".

If you don't do this your settings may be lost upon loading a new image file.

- **Correct version**

Make sure that you get the correct version. First, you want to make sure that the file you load is newer than your current firmware version. Second, check that it is the variant that is right for your equipment. The TOPEX ISDN GATEWAY devices may have two types of processors: codes are _64 and respectively _128.

Make sure that the image file that you load is suited for your processor. If you have older equipment, that doesn't show the _64 or _128 termination, it means you must look for firmware versions type _64.

- **No interruption**

Never turn off the TOPEX ISDN gateway equipment or the computer while the firmware is being overwritten.

Make sure that the adapter and your PC don't turn off during update. It is better to use an uninterruptible power supply (UPS) for this purpose.

- **Always backup!**

Remember that updating the firmware on the Topex ISDN box could cause some or all of the configuration settings to be lost, depending on the degree of change in the firmware. Therefore it is highly recommended that you save your current configuration before updating, then you restore it. To backup your settings, perform a Save, update the firmware, and then Load the saved settings, after you have updated the firmware.

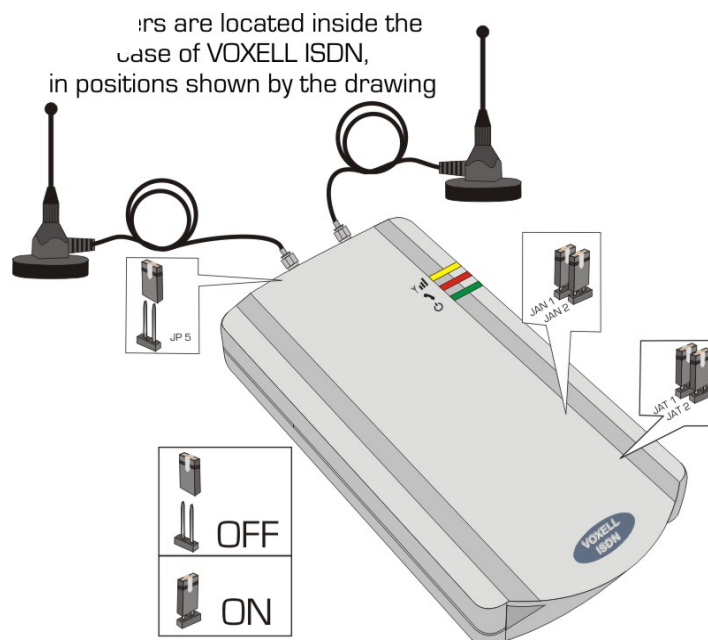
- **Resuming after an interruption:**

If the loading of the image file is interrupted (the mains power fails, the operating system on the PC stops, the cable is disconnected, etc) before reaching its normal ending, the new software may not be fully installed so the equipment it won't work.

To correct this, you should first reset TOPEX ISDN gateway (by taking off the supply jack for ten seconds) and try again to load the image file.

If this is not successful, you must change a jumper setting to perform forced loading of the application.

JP 5 is located near the top left corner of the printed circuit board of TOPEX ISDN GATEWAY, see indication of its position in the following drawing:



You must follow the procedure steps described below:

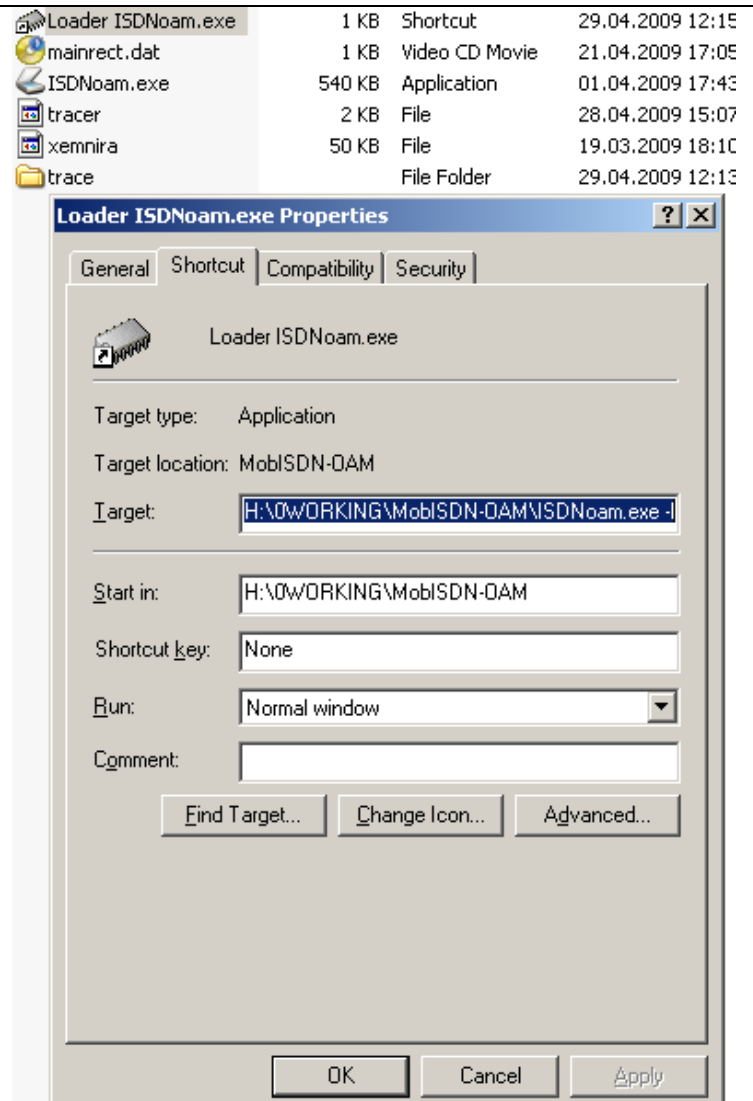
- power down TOPEX ISDN gateway (unplug the supply adapter)
- open the plastic case of the device and look at the printed circuit board
- locate jumper JP5 (top left, near the connector for antenna, as shown in the following drawing) and place a jumper on these two pins
- start up the OAM application with the "I" option. For this you go to the MS-DOS command line prompt and type: "ISDNNoam.exe -I"
- from the OAM program select the menu Options "Upload Image to Unit"
- choose the image file you want to load into the ISDN2GSM equipment. Note that in this forced mode of operation the authentication by password will not be requested anymore
- after the loading of the image file is ended, power down TOPEX ISDN GATEWAY
- remove the jumper from pins JP5
- close the case of TOPEX ISDN GATEWAY equipment and tighten the screws.

Now TOPEX ISDN gateway can be used normally with the new image file.

Explanation:

In normal operation, the bootloader is started first, upon power-up of TOPEX ISDN gateway. When the loading of a new image file has been interrupted before normal termination, the program loaded in memory may be corrupted, so it won't work correctly. To remediate this, you must place a jumper on pins JP5 to force the bootloader to start. Then it can load the application and download a new (correct) image file for TOPEX ISDN gateway.

To avoid going to the command prompt or using the Run option in the Windows Start menu, you could create a shortcut for launching the OAM application with the "-l" parameter. If you click the "Loader" shortcut instead of the ISDNoam application itself, it will automatically launch the program with the option "-l", thus forcing the loading. This shortcut may have associated a different icon, so you know which is the normal program and which for emergency repair:



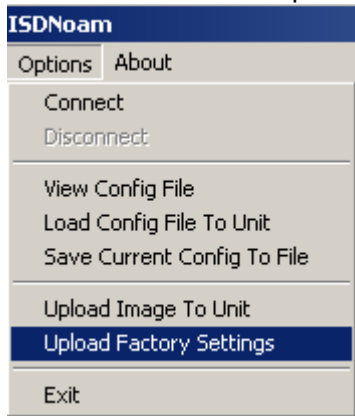
When you finish repairing the firmware, remember to take the jumper off pins JP5 before resuming normal operation of the TOPEX ISDN gateway!

6.8 Upload Factory Setting

You may need to restore the default settings on the TOPEX ISDN gateway (the initial configurations from the factory). Use this command to delete all current parameters and reinstate the parameters that were established by the manufacturer.

For this, you perform the following steps:

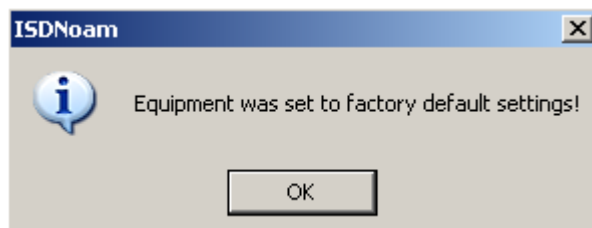
- start the OAM program, the OAM is not connected to the Topex box;
- from the Menu "Options", select "Upload factory Settings":



- you must Log-in, the program asks you for the password:



- if you have typed the correct password (topex), the program quickly uploads the default settings to the TOPEX ISDN gateway and shows a confirmation message:

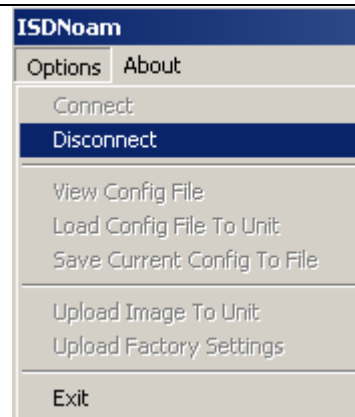


- now, you may connect to the box for performing the required configurations, or to load a configuration that was saved previously.

6.9 Exit - Exit from the OAM program

In a connected state, you should first **Disconnect** the OAM program from the box, then click Exit to quit the OAM program.

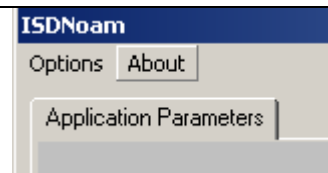
If you try to select the option **Exit** directly, you will see that it does not work, you must first click **Disconnect** ...



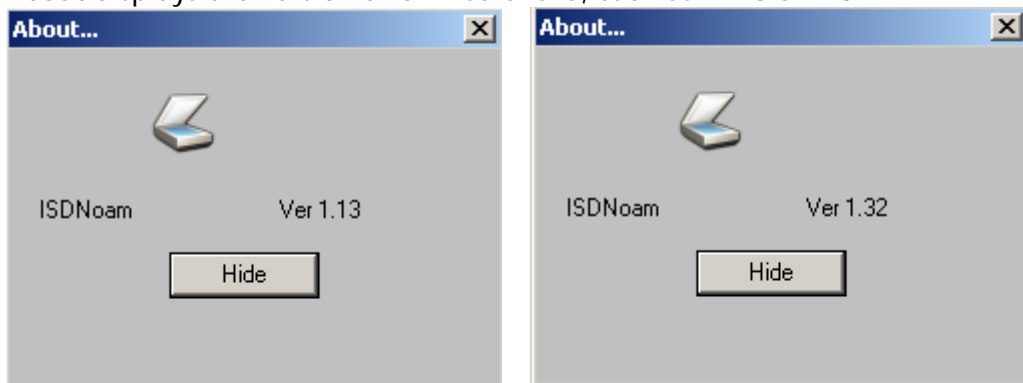
6.10. About

To the right of the **"Options"** item, you have **"About"**. It is available in any state: connected or disconnected, port open or closed.

Select **"about"** to see the current version of the OAM software running on your PC.



About displays the version of OAM software, such as 1.13 or 1.32:



Click to the button **Hide** to close the About window.

Remember that some features are available only in newer OAM releases, be sure that your OAM program is the latest version.

The current User Manual refers to OAM version 1.32.

7 CONNECTION EXAMPLES

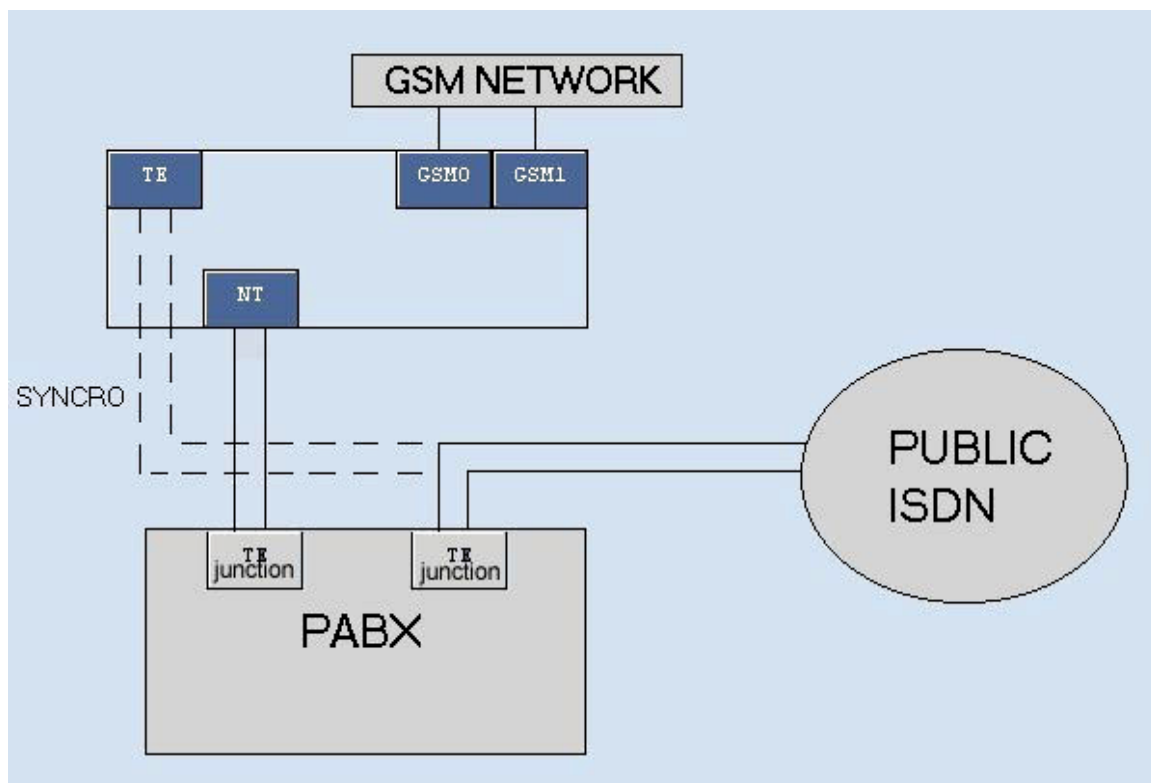
Before studying how to make use of the OAM tabs to set up routing rules, it is useful to review the possible modes of using TOPEX ISDN gateway together with a PABX private exchange.

In the following pages there are shown a few examples of interconnecting the TOPEX ISDN gateway equipment. The ports of the Topex box are figured as blue squares on the light blue background - two radio ports (the GSM modules) and two wired (ISDN) ports:

7.1 ISDN2GSM connected on its NT interface with a TE interface of PABX.

The NT connector of the ISDN-2-GSM is linked to a TE junction of the PABX, another TE of the PABX goes to the public ISDN, and TE port of the ISDN-2-GSM may linked to the TE of the PABX only for synchronization.

The SYNCRO clock (dotted lines) is received from the Public fixed telephony network (ISDN). The TE interface of the PABX is acting as a junction.



Outgoing from PABX

If the call is to mobile networks, the PABX routes it to through the TOPEX ISDN unit. The numbering is sent through the TE junction of the PBX to the NT connector of the TOPEX ISDN GATEWAY. TOPEX ISDN gateway performs further routing, it uses one or two directions for the calls received from the PBX: DIR0 for module GSM0, one mobile network, DIR1 for module GSM1, the other mobile operator. The call will be routed according to the number dialed to the respective mobile operator

If the number dialed is for the public ISDN network, the PABX routes it through the TE junction connected **directly** to the public network, by-passing the TOPEX ISDN gateway unit.

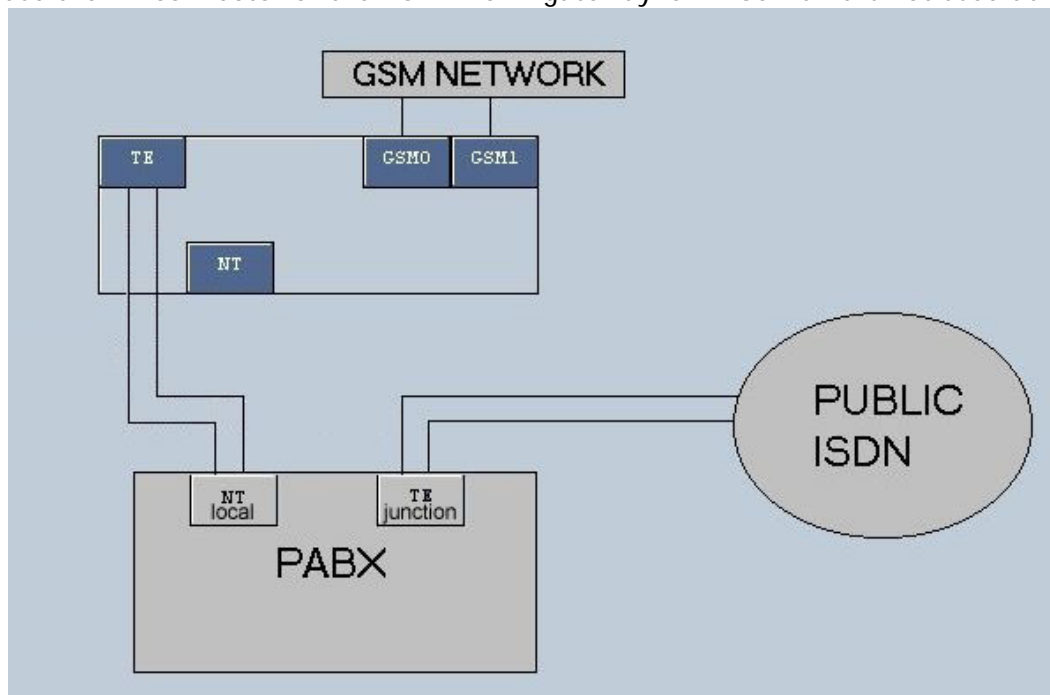
Incoming from GSM to PABX

From the 2G/3G network an incoming call will be forwarded to the NT interface. The decision is taken depending upon the CLIP GSM table or the Dynamic CLIP list. If the incoming phone number is not found in the table, decision is taken depending on routes from the GSM module. The options involved are DISA, OPERATOR and the Target settings (from the CLIP table or from the GSM settings).

The destination of the call will be a specific local extension of the PABX or the operator of the exchange.

7.2 ISDN2GSM connected on its TE interface to a PABX NT local.

In this variant the TE connector of the TOPEX ISDN box is connected to the NT port of a local board of the PABX. Calls to public network go out of the PABX through a TE junction. Note that in this case the NT connector of the TOPEX ISDN gateway ISDN2GSM unit is not used at all.



Outgoing from PABX

The local subscriber dials the number of the local extension (NT local) position where the TOPEX ISDN GATEWAY is connected. TOPEX ISDN GATEWAY answers with dial tone. The DISA option must be established in the settings for TE interface. The subscriber will dial the outgoing mobile number. The call will be routed on a 2G/3G module by applying the routing table policy (the call is sent out into the adequate 2G/3G network for least costs).

Note that the number of the GSM subscriber must be dialed in DTMF mode!

If the dialed number is for the public ISDN network, the PABX will route the call instead of NT through its TE junction which is connected directly to the public network.

Incoming to PABX

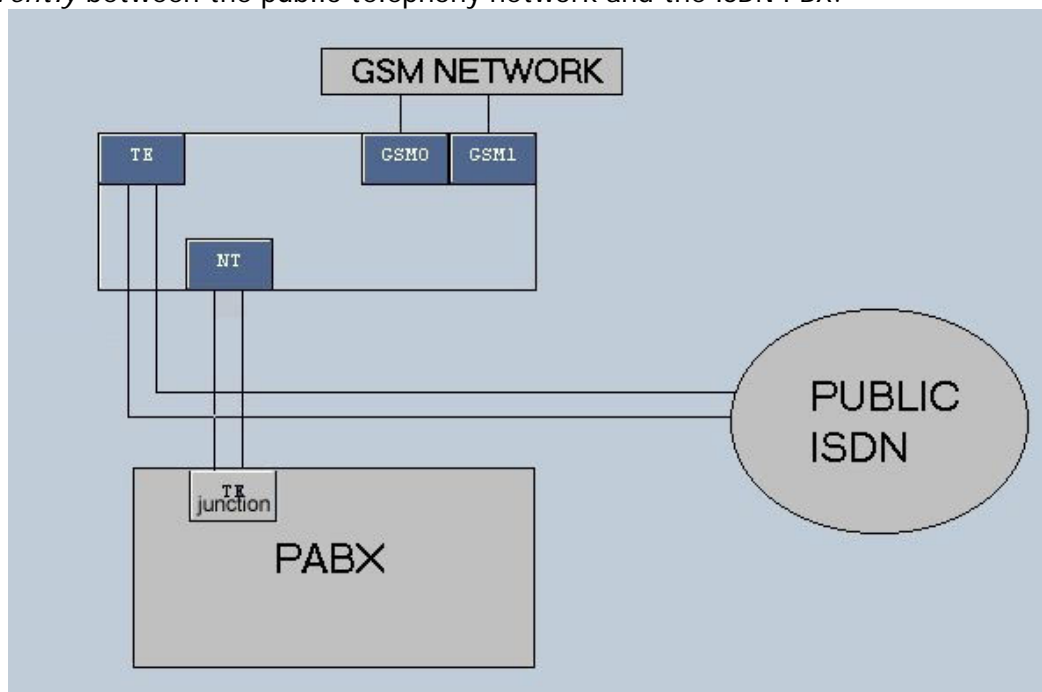
The calls coming from the mobile networks can be routed to their destination either through DISA or with help of an operator.

An incoming call from the 2G/3G networks will be forwarded to the TE interface by checking the identity in the CLIP-GSM table. In case of missing Caller ID or the number is not found in the records, the routing is performed by checking the GSM settings.

The involved options are DISA, OPERATOR and the Target settings (from the CLIP table or from the GSM settings). The destination of the call will be an extension of the PABX or the operator.

7.3 ISDN2GSM connected on its NT interface with PABX and with the TE interface with the public ISDN.

Only one TE junction of the PABX is used in this case. TOPEX ISDN gateway is connected through its TE interface directly to the public telephony network. The ISDN2GSM unit is inserted *transparently* between the public telephony network and the ISDN PBX.



Outgoing from PABX

The PABX exchange will forward the calls to the TOPEX ISDN2GSM system. The numbering is sent directly from the TE junction into the NT connector of TOPEX ISDN GATEWAY. In this case, calls coming in through NT connector of TOPEX ISDN gateway can be routed through one of three directions: GSM0, GSM1 and TE (to public network).

The routing is performed by the TOPEX ISDN gateway, not by the PBX.

The call will be routed according to the number dialed either through GSM0, GSM1 or the TE interface.

The user can place the module GSM 0 on direction 0 and the GSM1 on direction 1.

0:	Vodafone
1:	Orange

The TE interface will be placed on the third direction

TE Direction	PSTN
--------------	------

Incoming to PABX

The calls from the public ISDN are transferred transparently towards the PABX.

For this, in the configuration window for Incoming Calls of the TE interface you must select the "PassThrough" option.

The "TE" from the PABX will act as a junction.

The calls coming in from the 2G/3G networks are analyzed by checking the identity in the CLIP-GSM table.

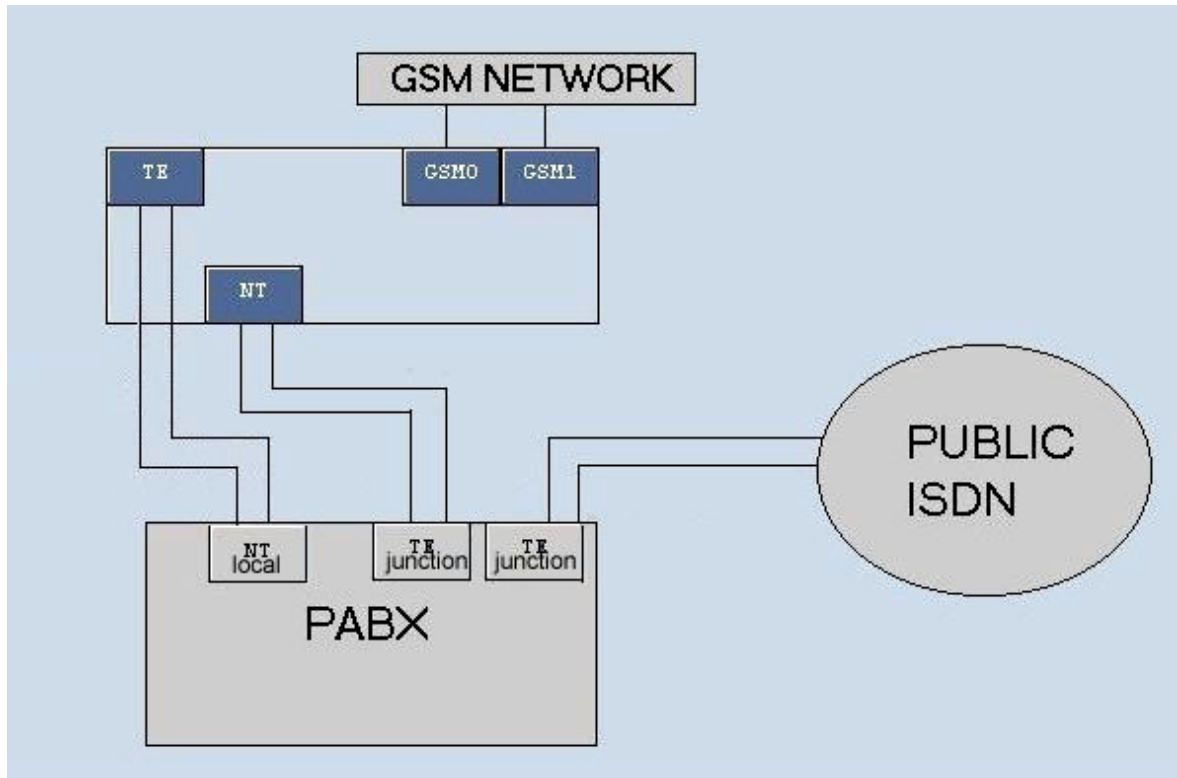
If the ID is missing or the caller is not found in the CLIP-GSM records, routing will be performed by TOPEX ISDN GATEWAY according to the settings of the GSM module.

The incoming calls from the mobile network can be routed either through DISA or with help of a human operator.

Incoming Calls	
<input type="radio"/>	DISA Tone
<input checked="" type="radio"/>	Pass Through

7.4 ISDN2GSM connected on its NT interface with a TE junction of PABX and with its TE interface with NT interface of the same PABX.

In this configuration, all ports of the box are used. The NT connector of the TOPEX ISDN gateway is linked to a TE junction of the PABX (one junction board). Another TE junction of the PABX goes to the public ISDN network. The TE connector of the ISDN2GSM goes to the NT port of a local board of the PABX.



Outgoing from PABX

The outgoing calls exit through the TE connector of the PABX junction. The PABX directs the calls to mobile networks through the TOPEX ISDN gateway unit. The calls will be routed according to the number dialed through GSM0 or GSM1 placed on one of two directions (for example 0 and 1). If the number dialed is for the public ISDN network, the PABX will route the call through another TE junction, directly to the public network.

Incoming to PABX

Calls from mobile networks get into PABX via the TE connector of the Topex ISDN2GSM unit.

When a GSM call comes in, if the setting in the GSM "Call handling" window is **Use target No**, the call will go to the local extension you have specified in the field "Target No".

Call Handling	
<input type="radio"/> Disa Tone	Target No
<input checked="" type="radio"/> Use Target No	120

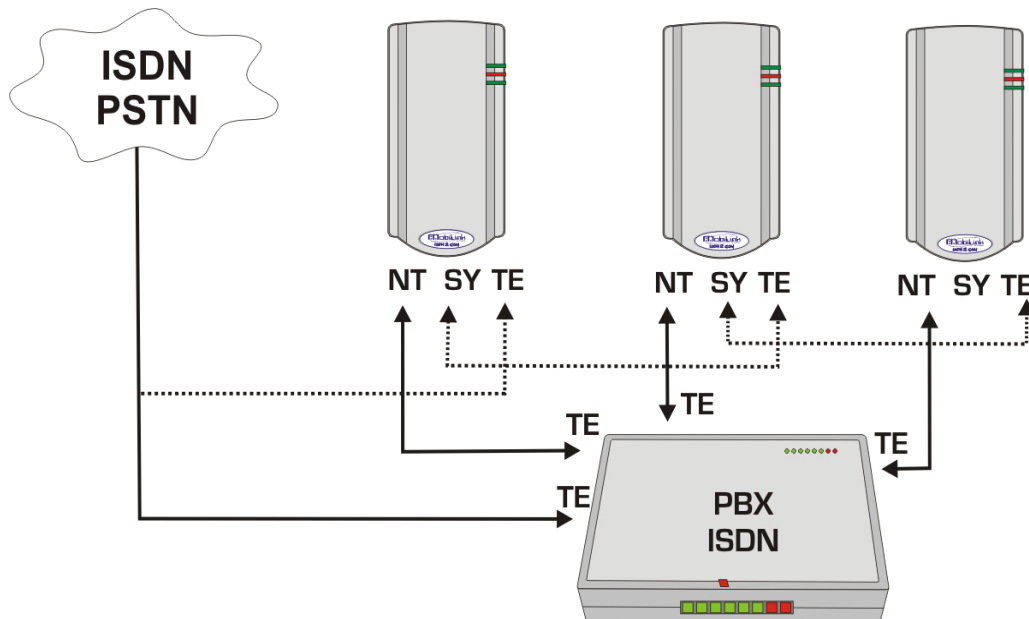
From the PABX this is the same as if it were a local call!

If the setting is DISA, the caller gets a DISA tone and he can dial any local subscriber he wishes. Also, he can make calls to the public network, acting as a local subscriber of the PBX.

Incoming calls from the 2G/3G networks will be forwarded to the TE interface by checking the identity in the CLIP-GSM table and in case of missing ID or number not found in the records, by checking the GSM port settings. The GSM options are DISA, OPERATOR and the Target.

7.5 Using several TOPEX ISDN GATEWAY units

It is possible that you need to connect **more than one** ISDN2GSM unit to the same PABX. For example, you want to use *more than two* mobile operators for optimal routing. For instance, in Romania there are four different mobile network providers. Alternately, you may want to have several 2G/3G modules for the same operator, if there is an intense GSM traffic or if you have established that when one 2G/3G module is busy, the call to be routed through another module. In this case several ISDN-2-GSM units (two, three or more) will be used with the same PABX. You must ensure synchronization of all the TOPEX ISDN gateways.



For this purpose, clock synchronization is taken from the Public ISDN and goes to the TE connector of the first TOPEX ISDN gateway, shown to the left in the above picture.

Then the clock signal goes out through the SYNC connector of that TOPEX ISDN gateway to the TE connector of the second TOPEX ISDN gateway, and so on in a daisy chain. You can have as many TOPEX ISDN GATEWAY units as you need.

Remember, the last TOPEX ISDN gateway in the chain must have the termination resistors for the TE interface activated (hardware configuration).

8 DESCRIPTION OF TABS

On the Menu, below Options, a menu bar is shown, containing several tabs for file cards. Their number depends of the connection state, which is when the program is connected to a Topex box, all the tabs are available, while in offline mode of operations, only some of the tabs are shown. Clicking on a tab, brings to the front the respective file card (screen of settings).

These tabs are described from left to right:

8.1 Direction Names

If you select the "Direction Names" tab in the "menu bar, the window for editing the names of the directions and configuring call diversions will be displayed:

Here you can:

- define the direction names (The TOPEX ISDN gateway unit box can handle a maximum of **three** real directions);
- fill-in the overflow rules to be used in operation for call diversion.

8.1.1 "Directions" option

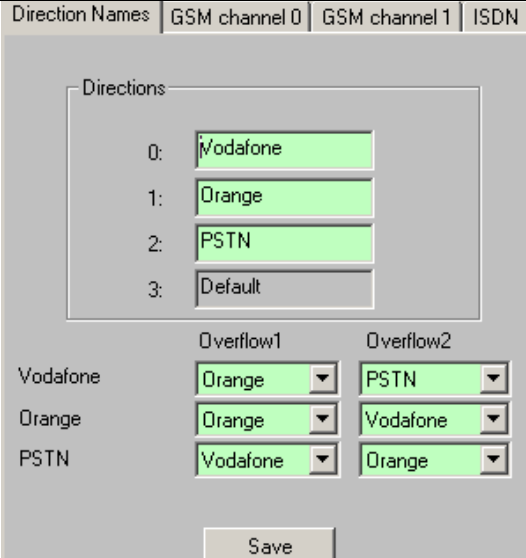
The routing of the calls is based upon rules for dialing and defining of DIRECTIONS - in a PBX, the directions are groups of trunks or lines that have similar routing characteristics.

Two of the directions of TOPEX ISDN gateway can be assigned one to each GSM port and the third to PSTN (on the "TE" or "NT" interface).

You may change the name for directions 0,1 and 2 from the default names "Direction 0", "Direction 1" and "Direction 2". Usually, you should assign to them the names of the respective mobile carriers, such as Orange and Vodafone for Romania, as shown in the following example.

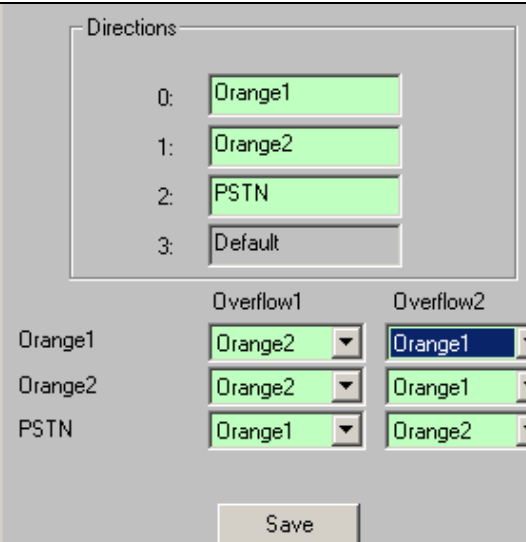
The "Direction 3" name can't be changed from Default. It is shown in gray color to indicate that it is not editable. This fourth direction is not a real direction for routing the calls, it may be used to reject (forbid) calls. If you select this "dummy" direction in the Routing Table for some prefixes, the corresponding calls will be forced to a "non-existent" direction.

Usually, the two mobile modules are included, assigned each to a network operator, in order to ensure the routing of calls for minimum costs. In this example, the first direction, module GSM 0 is assigned to the provider Vodafone, while the second, module GSM 1, is assigned to the provider Orange.



The screenshot shows the 'Direction Names' tab with columns for GSM channel 0, GSM channel 1, and ISDN. Under 'Directions', there are four entries: 0: Vodafone, 1: Orange, 2: PSTN, and 3: Default. Below this, there are two columns for 'Overflow1' and 'Overflow2'. For 'Vodafone', Overflow1 is Orange and Overflow2 is PSTN. For 'Orange', Overflow1 is Orange and Overflow2 is Vodafone. For 'PSTN', Overflow1 is Vodafone and Overflow2 is Orange. A 'Save' button is at the bottom.

But if a group of subscribers have higher priority, you may assign both mobile modules for the same carrier, with direction names such as Orange1 and Orange2. The direction Orange 1 will be reserved for the usage of the group of subscribers with higher priority.



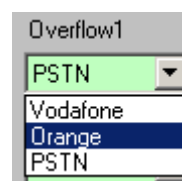
The screenshot shows the 'Direction Names' tab with columns for GSM channel 0, GSM channel 1, and ISDN. Under 'Directions', there are four entries: 0: Orange1, 1: Orange2, 2: PSTN, and 3: Default. Below this, there are two columns for 'Overflow1' and 'Overflow2'. For 'Orange1', Overflow1 is Orange2 and Overflow2 is Orange1. For 'Orange2', Overflow1 is Orange2 and Overflow2 is Orange1. For 'PSTN', Overflow1 is Orange1 and Overflow2 is Orange2. A 'Save' button is at the bottom.

8.1.2 Overflow

At the bottom of the previous image you can see the overflow (call divert) panel. There are three "Direction" rows with two "Overflow" columns each.

Inside the GSM network, the call diversion feature makes the network call a different number in case the dialed number is busy or otherwise unreachable. For instance, you may set up a diversion from operator 1 to operator 2, to always ring operator 1. If the mobile carrier 1 is busy or unavailable, operator 2 will be called automatically and the customer does not need to manually make a second call.

Each line is used for one direction and establishes the first and the second overflow option. For each overflow, the direction numbers can be Direction 0, 1 and 2, or the names you previously defined - Vodafone, Orange and respectively PSTN.



Should you want to specify that a direction does not have an overflow, simply set that field to the same name as the direction name.

For example at the direction "1" - named "Vodafone", if you specify "Overflow1" = "Vodafone" then no overflow will be set. This is the default configuration.

If you specify "ORANGE" then when the direction "CONNEX" is unavailable or busy, the direction "ORANGE" will be used to route the call. You can also select a second overflow direction (Overflow2) to be used for call diversion in case the first overflow direction also becomes unavailable or busy.

You may also use the Overflow feature to implement a higher priority for a group of subscribers. In the example above, only the high priority clients are assigned to the direction Orange1, and if this direction is unavailable (the respective mobile module is busy), it will overflow over the direction Orange2, which is used by all the local subscribers.

8.2 GSM module configuration -GSM channel x

To configure a GSM module (0 or 1) click on its tab at the top of the screen and the "GSM Settings" window shows up, allowing you to specify the operating parameters for the respective GSM module:

The screenshot displays the ISDNoam application window with the 'GSM channel 0' tab selected. The interface includes a menu bar (Options, About) and a tabbed interface with tabs for Direction Names, GSM channel 0, GSM channel 1, ISDN cfg, Routing, CLIP list, DynCLIP, Replace Identity, Trace, Monitor, CDR, SMS, and Terminal.

General Settings:

- Direction: DigitMobil (dropdown)
- Network Locking: Network Selection (Automatic dropdown), Network ID (text field)
- Delete incoming SMS: (checkbox, unchecked)
- SIM Pin Code: 1234 (text field)
- Timer Reset: OFF (dropdown), (min) OFF-disabled

Incoming Calls:

- Allow Incoming Calls: (checkbox, checked)
- Destination Port: NT (dropdown)
- Call Handling: Disa Tone (radio button, unchecked), Use Target No (radio button, checked), Target No: 120 (text field)

Billing Pulses:

- AOC: (checkbox, checked)
- Audio Billing Pulse Warning: (checkbox, checked)
- Pulses: Number of pulses at response: 3 (text field), Pulse generating period (sec): 45 (text field)

Outgoing Calls:

- Allow Outgoing Calls: (checkbox, unchecked)
- CLIR: (checkbox, unchecked)
- Call Progress Tones: (checkbox, checked)

Signal Strength:

- STATUS: REGISTERED (text field)
- Strength: -103 (dbm) 5 (0/31) (text field)
- SetNetwork: (button)

LEVEL:

- Output: (checkbox, checked), Default: (button), Set: (button)
- Input: (checkbox, checked), Default: (button)

At the bottom, there is a SIM Card ID field (---), an IMSI Code field (22605000121306), a red 'Port Opened' status bar, and the Topex logo. The version 'isdnaG4.1_128' is displayed in the bottom right corner.

Depending on the selected 2G/3G module the title of the open tag will be "GSM channel 0" for the first 2G/3G module and respectively "GSM channel 1" for the second GSM module.

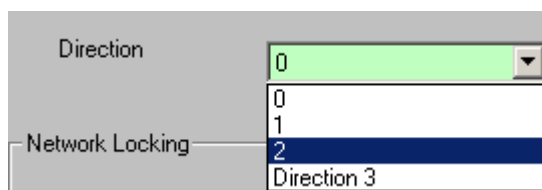
Also, a few features (Network selection, Level) are available only with certain types of mobile modules.

8.2.1 General settings

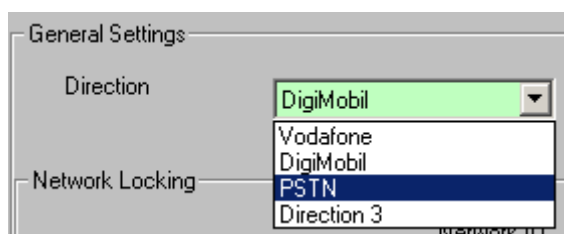
Direction - the “direction” or trunk group to which the port belongs. There are four possible directions: 0, 1, 2 and 3. To the first three values you may assign names, such as the names of mobile carriers (Vodafone, Cosmote, and Orange). The names of the directions are established in the “Direction Names”, the first tab of the OAM program. Generally the first two directions are for the two mobile networks while the third is for the PSTN

The fourth direction, Direction 3, cannot be renamed, since it is not a real one, it is used only to **forbid** (prohibit) access to certain prefixes. “Direction3” is in fact a rejection criteria, it is used for telephone numbers that you want to be rejected (no calls are allowed towards these numbers).

Select from the drop list the “direction” where the current mobile module will be assigned. If you have not defined direction names, you will see the default names: 0, 1, 2.

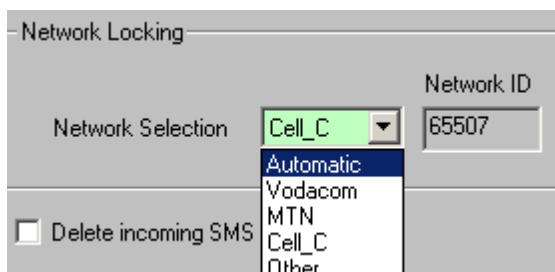


After defining the names of the directions, they will be available for selection in the “Direction” drop list, as shown here:



8.2.2 Network locking

Use this feature if you want to lock the mobile module to a specific mobile carrier.

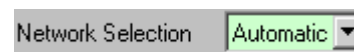


Mobile phone manufactures have built into GSM phones the network lock or subsidy lock capability. Network providers can this capability to restrict the use of these phones to specific countries and network carriers. Here you can apply network locking to the modules of the TOPEX ISDN equipment.

The field “Network selection” lets you select from the drop list the name of the mobile network where you want to lock the module.

By default, it is set on Automatic, which means there is no locking,

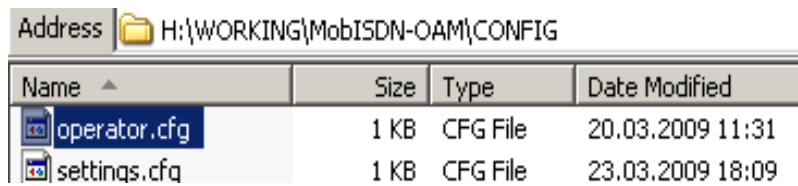
the module automatically detects the mobile network to be used.



Following the field “Network selection”, the field Network ID, which is not editable, shows the Operator codes for each of the mobile networks in the list.

Out of the five digits, the first three represents the country code, such as 655 for South Africa in the above example, or 505 for Australia, and the next two digits represents the operator (carrier) such as 01 for Telstra, 02 for Optus, 03 for Vodafone, and so on/

You may edit the file "operator.cfg", located in the CONFIG sub-directory of the OAM program:

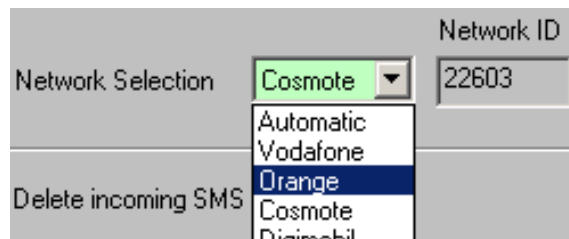


It is a text file, where there are stored the names of the operators together with the corresponding country and network codes. For example, the operator file for Romania may contain this information:



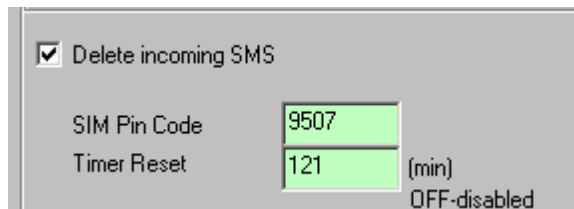
As you notice, the country code is 226, and the operator codes are 01, 10, 03, 05 and so on.

After starting the TOPEX ISDN gateway with the new configuration file, the corresponding drop list for "Network selection" will look like shown in the next image:



8.2.3 SIM and SMS

The next block of settings is for the SIM card and GSM module:



Delete incoming SMS - when this option is enabled (the box is checked), the SMS messages are automatically deleted after being received and displayed. This is useful when you get many SMS messages, because if they are not deleted in time, they would fill the storage memory.

If the working memory is full, new messages can no longer be received, so you must delete them, either manually after reading or automatically.

SIM PIN Code - if the SIM card has enabled the request for PIN, you must complete this field with the PIN code for the respective SIM and 2G/3G module.

The default value is "1234" - this is used when checking for PIN code is **not enabled**.

The length of the field "Pin Code" must be four digits, with individual values between '0' and '9'.

Timer Reset - the time interval following which the GSM module will be reset.

This is useful in situations imposed by the particularities of the mobile network. For instance, if it is requested that the mobile modules are reset every two hours of operation, you enter the value 120 in the field Timer.

The default setting is OFF, which means no reset of the GSM module will be performed!

8.2.4 Incoming Calls

This section tells to the TOPEX ISDN gateway how to process the incoming calls (calls that get into the equipment via the mobile module).

Incoming Calls

☒ Allow Incoming Calls

Destination Port

NT

Call Handling

☐ Disa Tone

Target No

☒ Use Target No

1196

Allow Incoming Calls - by default it is checked, so the module can receive incoming calls. If you disable this option, then all incoming calls will be rejected!
Destination port - you must specify which ISDN port is the destination for the mobile calls; select either NT or TE.

NT

NT

TE

8.2.5 Call handling

The next two options **DISA Tone** and **Use target No** are used for directing incoming calls from the 2G/3G network. The option DISA and Target are mutually exclusive, only one of them can be enabled by the user at a time moment.

<div><div>TE Settings</div><div><div>Mode</div><div><div><input checked="" type="radio"/> TE Mode</div><div>TE Direction</div><div>PSTN</div></div><div><input type="radio"/> SYNC Mode</div></div><div>Connection Type<div>Point to multipoint</div></div><div>TEI Management<div>auto</div></div><div><div>Incoming Calls</div><div><div><input checked="" type="radio"/> DISA Tone</div></div><div><div><input type="radio"/> Pass Through</div><div>Forward No</div><div>0779999999</div></div></div></div>

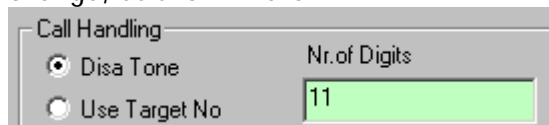
TE settings - DISA Tone

The mode of usage for the options is as follows:

- if **neither** DISA nor target checkboxes are enabled, that is a wrong situation because no method to deal with the incoming call is defined. If you **do not want to allow incoming calls** on a 2G/3G module, then the best method is to disable the "Allow incoming calls" checkbox for it.
- if **Use Target No** checkbox is enabled, as shown above, the call will be forwarded to the port of the ISDN PABX through the NT or TE interface. Then the human operator answers at the internal extension 1196 in the above example and decides which local extension to call. The interface was specified in the "Type" field. An ISDN SETUP message will be generated with the number specified in the "Target" field through the selected interface. The maximum size for the target field is 4 digits. If you type "---" characters you can specify an empty target (no number). In such a situation the ISDN-SETUP message will contain an empty called party number and the call will be routed to the operator of the PABX (if such a setting is validated in the PABX).

Note: the "Use Target No" field can contain only digits from "0" to "9" (the number of a local extension of the PBX, such as 105 or 1196) or the characters "---" to indicate an empty value.

- if **DISA** checkbox is enabled instead of Target , the incoming call will also be forwarded to a port of the PABX through the NT or TE interface, but the aspect of the window for settings will change, as shown here:



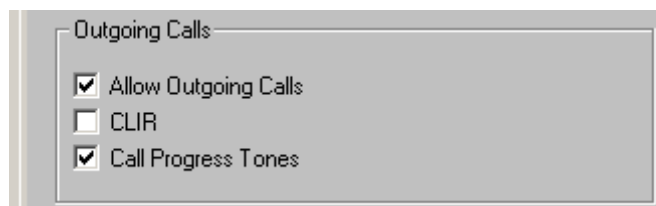
The screenshot shows a window titled "Call Handling". Inside, there are two radio buttons: "Disa Tone" (which is selected) and "Use Target No". To the right of these buttons is a text field labeled "Nr. of Digits". This field is highlighted with a green background and contains the number "11".

To the right, instead of the "Target No" field, a "Number of digits" field shows up. The incoming call will be answered by the TOPEX ISDN GATEWAY device and a DISA tone will be provided to the calling party. On this tonality the caller can dial (using DTMF codes) a local extension of the PBX or an external number to get out of the phone exchange.

Important! *When DISA Tone checkbox is selected, the field "Target no." becomes "Nr. Of Digits" and instead of the target, it represents the maximum number of digits that are waited to come from the 2G/3G network. When this number is reached, the call is forwarded, even if digits are still coming. You may specify at most 20 digits in this field. If you enter "0" no digits will be waited for. This means the ISDN-SETUP message will be sent without any called party number in it.*

8.2.6 Outgoing Calls

This panel holds settings for the outgoing calls:



Allow Outgoing Calls - if checked, the mobile port will be used for outgoing calls. If this box is not enabled, the GSM module will NOT be used for outgoing calls;

CLIR - if this option is checked then identity of the call will **not** be sent (identity restricted). By default, this checkbox is NOT enabled, so the identity will be sent out.

Note - *the option CLIR enables or disables sending of ID for all the calls performed over the respective mobile module. But the OAM program also has means to **individually** choose if you want to send out or not the ID. For more info about this feature, see explanation in the "Routing" tab, column "Identity".*

Call Progress Tones - if this option is checked then the user will hear in the headset the tones indicating the phases of the call.

Call progress tones are audible tones sent from the PSTN or a PBX to calling parties to indicate the status of phone calls. The technical characteristics intended usage for some wide use progress tones are defined in the ITU-T recommendations E.180 and E.182.

When this feature is enabled, the user will hear a tone as soon as the numbering has been sent to the GSM module, until the moment that ring back tone is received from the mobile network. If you disable this feature, no tones will be sent, the user will hear only silence on the line and he won't know if the establishing of the call is going on or not.

No calls

When **both** incoming and outgoing calls are disabled, the GSM module is no longer in use for calls.



In this case, the equipment will cut the power supply to the respective mobile module, which will be in the state "power off",

This state is indicated by a red RPS message in the field Status.



8.2.7 Billing section

This panel is for billing purposes (charging of the calls). The ISDN gateway can send out metering pulses for the purpose of accurately billing of the calls made through the equipment.

AOC - Abbreviation from "Advice of Charge", a signaling protocol used to send charge (billing) pulses to the PBX where TOPEX ISDN GATEWAY is connected.

AOC is the "charge" for the call, computed by the GSM terminal and expressed in terms of Home Units. The charge pulses are sent at the beginning of the call and during the call, according to two elements that you may program at the bottom of the window. For these, see details below.

If the option "**Audio Billing Pulse Warning**" is enabled (the box is checked), then set the billing pulses can also produce an audio (sound) confirmation at the calling party. This way, the caller knows that the call is charged, and may get an idea about the costs of the call.

Pulses

The two items that you may set up here are the number of initial pulses ("**Number of pulses at response**") and the time delay between two successive billing pulses ("**Pulse generating period**").

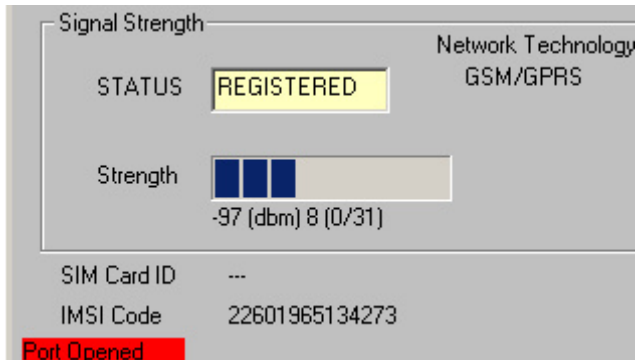
With the above settings, TOPEX ISDN gateway will generate two billing pulses upon answering, and then the time interval for pulses (the metering period) will be of 15 seconds.

These values are configurable, since the actual price of a unit of cost changes from one mobile network to another, as does the period after which billing pulses must be generated.

8.2.8 SIGNAL

The panel **Signal Strength** has several usages:

- displays info about the state of the GSM module, the level of the RF signal, the technology of mobile network that is selected, etc.
- lets you choose the type of network and the order of selection, the activation of the roaming service, etc.



The window periodically runs monitoring over the respective GSM module, in order to read the status, the reception level (shown in dBm), and the identification of the technology for the current mobile network.

Status

This field displays the current state of the GSM module.

The different states have associated specific background colors - blue for conversation or incoming call, yellow for registered but not busy (available), red for errors (the module is not available for calls).

STATUS **RPS**

RPS - the GSM module is powered off.

This can happen, for instance, when the module is NOT selected in the configuration. When neither Incoming calls nor Outgoing calls are checked, the equipment shuts down the power supply for the respective mobile module.

STATUS **SIM_NRY**

SIM_NRY - SIM card **not ready**. This message is shown also when no SIM is present in the slot of the respective module.

STATUS **INIT**

INIT - module is in the initialization phase, initialized using AT commands.

STATUS **P_ON_M**

P_ON_M - module is in "power on" state.

This message is encountered in the beginning, when the Topex box just starts to operate and the GSM modules are powered. Also, each time you perform changes over the operating parameters, the module is resetted, after applying new settings, so it will go through the phases P-ON and Search in order to become Registered with the mobile carrier.

STATUS **SEARCH**

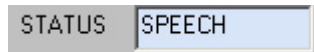
SEARCH - the module is searching for mobile networks, it tries to registered in the network

PIN_ERR - SIM PIN code error, the SIM card request a PIN code and the value that has been entered is not correct!

OP_LOCK - Operator lock, the module is locked in a particular GSM network and cannot work with another provider

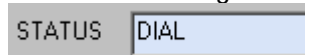


Registered, the normal standby state - the module is registered with the mobile network

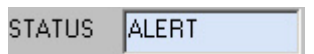


SPEECH - the module is in a call, a voice conversation is going on.

ALOC - module is allocated for an outgoing call but the voice call AT commands were not yet sent. The module is not available for another GSM call! This is encountered for instance when not all the digits of the phone number have been received from the BRI interface, the module still waits for digits.



DIAL - the module is dialing a number, an outgoing call ins routed through this module and it is in the phase of dialing the phone number of the destination



ALERT - the module is in state of alerting



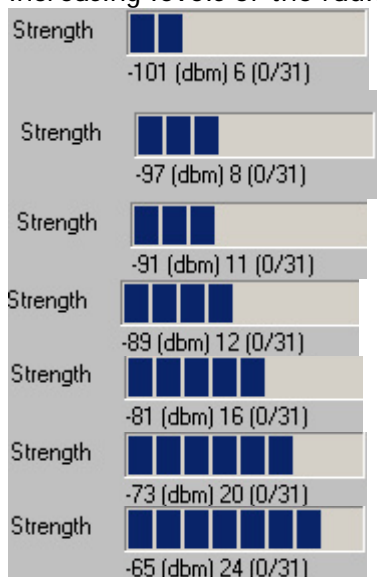
INCOM - an incoming call from the mobile network is presented to the module.

	<p>Strength</p> <p>The level of the signal received from the mobile network is displayed in three different modes:</p>
--	---

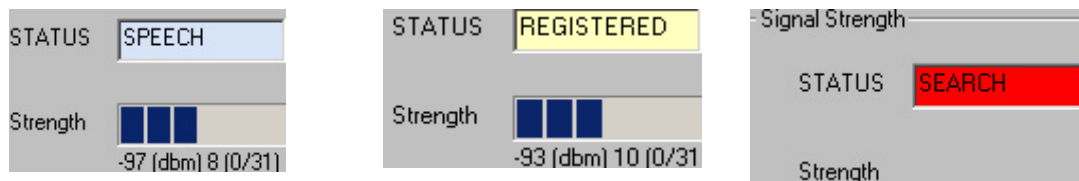
- graphically, as an indicator bar, with one, two or more blue rectangles showing the level of the RF signal
- as a precise, absolute value, from one to three figures, such as -103 or -73. It is expressed in dBm.
- as a relative value on a scale from 0 (minimum) up to 31 (the maximum). For instance, the strength of -103 dBm is equivalent to the relative value of 5, while -65 dBm shows a relative value of 24 (out of the 31 maximum).

Each mode of display has its advantages: the graph made of rectangles is the fastest to be seen, but not very precise, the absolute value is the most accurate, while the relative scale is useful for making comparisons between different types of external antennas, their locations or the orientation, if directional aerials are used.

In the images below you can see some examples of indications in the field "Strength", with increasing levels of the radio signal:



Of course, the signal strength can be displayed only in an operational state of the mobile module, that is when it is registered, dialing, in a call, etc.



When the module is in one of the state marked with red background, the information about level of the RF signal is **not** available.

Network

This panel has double function, both showing information and allowing setting:



- it **displays** under the "Network technology" title in bold letters the technology of the mobile network where the module is actually connected, provided that the network allows this;
- it allows you to select (with the button SetNetwork) several options concerning registering with the mobile network

Display:

Network Technology EDGE	2,5G technology, EDGE network
Network Technology GSM/GPRS	2/2,5G technology GSM/GPRS
Network Technology UMTS	3G - third generation, UMTS
Network Technology SetNetwork	no info is available, the technology is probably the standard GSM

Select

Click the button "Set network"



The window "Network Registering Options" shows up:



Network Selection Options

Here you can establish of the selection of the type of network to which the module will connect. The default is Automatic search, but you can make the module connect either only to 2G networks (GSM, GPRS, EDGE) or only to 3G networks (UMTS).

Roaming Option

You can enable or disable the Roaming feature of the SIM card.

Roaming is a term in mobile communications meaning the extension of connectivity service in locations which are different from the home location where the service was registered, for instance in foreign countries.

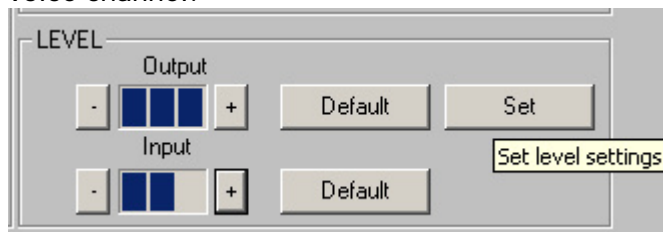
By default, Roaming is permitted on TOPEX ISDN unit, but you can forbid it.

Network Order Selection

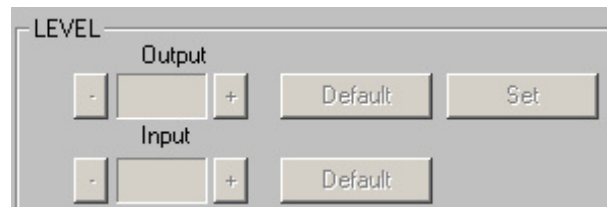
Here you can define the order in which the module will look for mobile networks to register to. The default value is Automatic search, but you may tell the module too look first for GSM networks, and only afterwards for UMTS, or you can specify the reverse order of search for networks.

8.2.9 Level

When the feature is active, you can modify the sound level both for the output and input of the voice channel:



Note that this feature is not available for all types of modules; if the GSM modules do not support this, the panel will be colored in gray, indicating that it is currently inactive.



This panel allows you to set the audio level for **input** and **output**.

The range of audio level is from 0 to 3, where zero is the maximum attenuation, while 3 is the least attenuation, thus the maximum level of sound .

The sound levels can be decreased or increased individually with the buttons "-" and respectively "+".

The selected level is shown as a bar-graph.

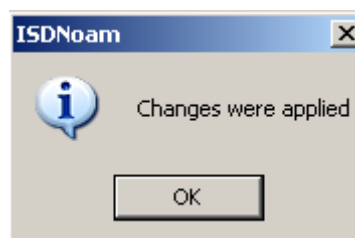


You may use the "Default" button located to the right to restore the default level for input and/or output.

This default value is 1, in a range from 0 to 3.

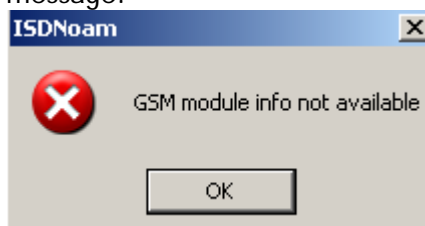
Note1: Use the button "Set" located to the right to apply the settings for the sound level. All other modifications are applied when you use the button "Save", but sound level is related to AT commands and you should use the button "Set".

After successfully performing the modification of audio settings, the equipment will show a confirmation message:



Note2: The audio volume can be set up only when the STATUS of the module is either REGISTERED or SPEECH.

If the module was busy dialing a number, or sending / receiving SMS messages, it is not available for interrogation, so the request to set a different audio level will result in an error message:



In this case just wait for the module to become again available for setting the audio level!

Note3: Do not change the audio level parameters unless absolutely necessary, as this may affect the voice quality.

The "GSM channel x " window periodically runs monitoring over the respective GSM module, in order to read the reception level (shown in dBm), the identification of the current mobile subscriber and other information, so there is no need for a "Refresh" button, you just wait a few seconds to be sure that the data displayed are properly updated .

8.2.10 Identification

	<p>The bottom right corner of the OAM screen shows identification info about the SIM card.</p>
--	--

SIM Card ID - identification of the respective SIM card, if this function is supported by the operator

IMSI Code - the IMSI (International Mobile Subscriber Identity) code, which is specific to the subscriber, therefore to the Sim card used. See below a few IMSI codes, from different SIM cards used in the modules of equipment:

IMSI Code	22605000121306	
IMSI Code	22601965134273	
IMSI Code	22610241004320	22601853012194
IMSI Code	22610100373296	22610574108729

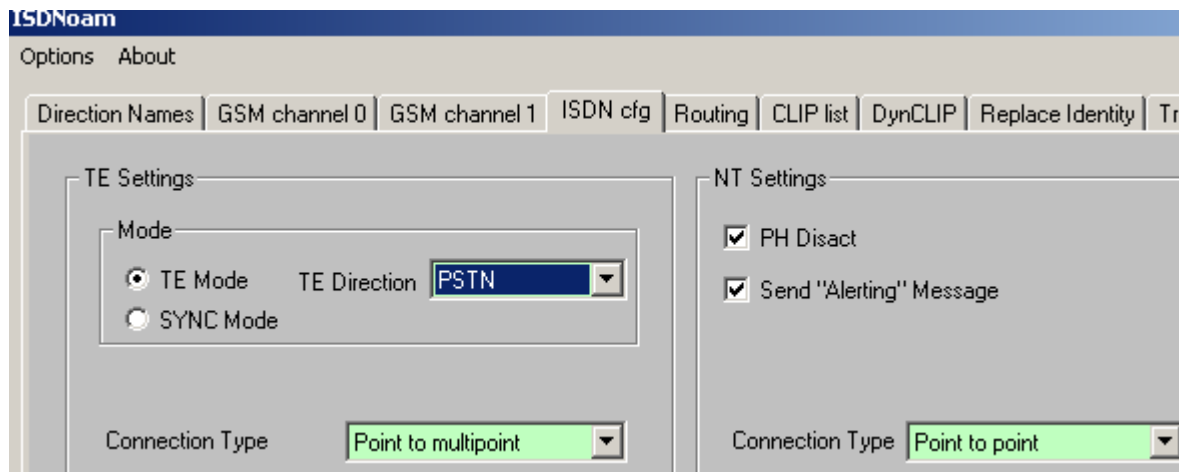
8.2.10 Serial port Indication

Shows the state of the serial port used for connection between OAM program and the Topex box. It can be closed, opened (transmitting data or commands) or off-line (TOPEX ISDN gateway not connected)

IMSI Code			
Port Opened		Port Closed	Offline

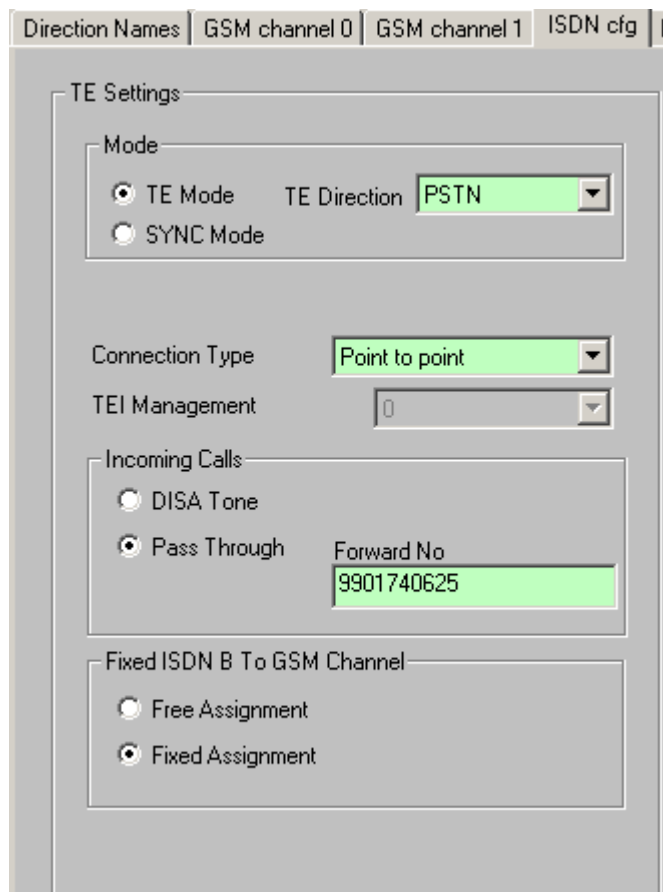
8.3 ISDN BRI settings

This file card refers to the set-up of the ISDN BRI ports (TE and / or NT).



8.3.1 Configuring the TE Interface

To configure the ISDN-TE interface, click the "ISDN cfg" tab and go to the panel at the left, which has "TE Settings" in it and the windows with the settings for the TE port will appear, as shown:



TE Mode - if it is enabled, that port is activated as a TE-type ISDN interface;

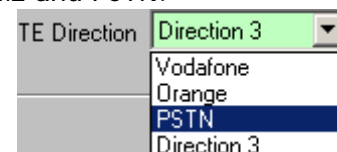
SYNC - this option specifies that the TE interface will be used only for synchronization from the public network. (See chapter about "Modes of Connecting TOPEX ISDN gateway" for details about connecting several units and synchronizing them).

Note: Only one of the options "TE" or "SYNC" can be selected at the same time, if you check one of the boxes, the other will become un-checked;

A synchronization may prove to be necessary when the PBX that also uses connection to PSTN shows a large number of errors (frame slips, bit slips). Normally such errors are unimportant for voice communications, but in larger telecommunication systems problems may arise because the device in "error" could be isolated. To avoid this, you should use synchronization - the TE interface of TOPEX ISDN gateway is used as synchronization input, connected directly to the PSTN. The synchronization clock is then derived from this signal.

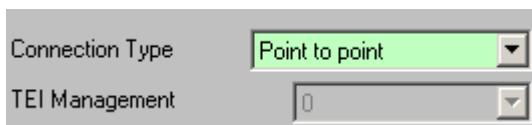
TE Direction - the direction to which the TE port will be assigned belonging. There are four possible directions, out of which only three are active: GSM1, GSM2 and PSTN.

Typically the two mobile modules are assigned to mobile carriers, different or the same operator, while the TE or NT port shall be assigned to the public fixed telephony network.



"Direction 3" is a dummy one, to be used only for the calls that you want to be rejected - they will be routed through this direction, which is in fact not active.

Connection Type - refers to the ISDN connection.



You should select this according to the type of the equipment (digital PBX or telephone) that TOPEX ISDN gateway is connected to.

Available options are "Point-to-point" (default) and "Point-to-Multipoint". The Point-to-Point is used to connect only two devices, and it uses the **DDI service** (Direct Dialing In). You should use this in the most usual case, when TOPEX ISDN gateway is connected to an ISDN phone exchange.

But when you have the TOPEX ISDN gateway unit connected to one or several ISDN phones or modem, you can **no longer use the Point-to-Point**. Instead, you must select from the drop list the option "Point-to-Multipoint", which allows you to connect several ISDN equipments (from two up to eight):



Instead of DDI, Multipoint uses the **MSN service** (Multiple Subscriber Number). The "Point-to-Multipoint" connection should be used for ISDN phones or other ISDN terminals.

TEI Management - establishes the administration of TEI.

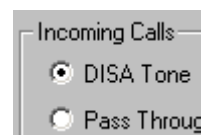
"Terminal Equipment Identification" is an internal ISDN identification of connected phones. Allowed values are "0" or "auto", and this is related to the previous setting - the type of ISDN connection.

For the default point-to-point connection, a value of "zero" must be used for TEI. (It can be changed only in exceptional cases.). If you select "Point-to-multipoint" as connection type, TEI Management field automatically switches to "Auto", which is the value that must be used for the point-to-multipoint connection.

Incoming calls

This section establishes the treatment of incoming calls.

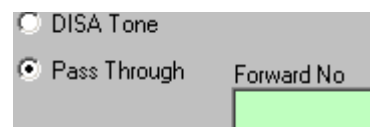
DISA Tone - this option is used in case of incoming calls on TE ISDN interface. You must mark either DISA (default) or Pass Through.



The TE interface of ISDN2GSM device is connected to the NT interface of a PABX exchange. The NT interface of the PABX is a local interface, so the TOPEX TE interface will be called with the number of a local extension of the PABX. The ISDN2GSM system will answer to the call and give a DISA tone, allowing the calling party to dial numbers through DTMF tones. Then the called number will go on to the routing table analysis.

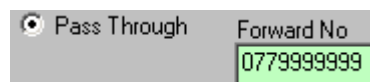
PassThrough - the option complementary to DISA. It is used in case of incoming calls from the Public ISDN network on the TE ISDN interface (situation presented in the case 3 in the subchapter about modes of connecting MobiLink).

In this situation the call will be forwarded transparently to the PABX, it just passes through the TOPEX ISDN GATEWAY unit.



The TOPEX ISDN GATEWAY unit is inserted transparently between the ISDN public telephony network and the ISDN phone exchange.

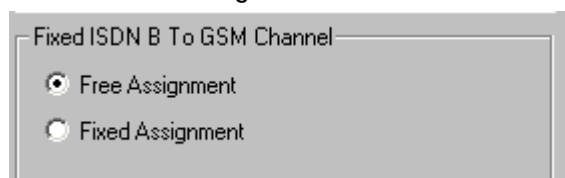
Forwarding Number - by default it is empty. But when a mobile telephone number is inserted in this field, then the forwarding




will operate like a "night service", the call will be routed via a mobile phone number instead of the PBX. If you enter a mobile phone number in this field, the incoming calls (from the PSTN network) will be routed through the GSM module and forwarded to the respective mobile number).

This setting may be used at night, when there is nobody on the premises, incoming calls are forwarded via one of the mobile modules, instead of being fed to the PBX.

ISDN to GSM Assignment



This panel establishes the allocation of the two "B" voice channels of the ISDN link. By default, it is set to Free, meaning the assignment of ISDN calls to GSM modules is free (it will be established by the Routing table of equipment).

If instead you select "**Fixed assignment**"  **Fixed Assignment**, the allocation of ISDN B voice channels to GSM modules will be fixed, established by the ISDN setup message. Suppose that you use SIM cards for two different mobile providers. Then the setup message may tell "always assign channel 1 to GSM module 0 and channel 2 to module 1". In this case, the routing table no longer matters, all calls coming in from ISDN are processed only according to the setup messages, which are issued by the PBX.

You may choose this mode of operation when you do not want to bother with configuring the routing table on equipment, while on the PBX connected to TOPEX ISDN gateway you must always configure properly the routing rules.

8.3.2 Configuring the NT Interface

The NT interface is similar to the TE interface, but it has fewer programmable functions:

NT Settings

☒ PH Disact

☒ Send "Alerting" Message

Connection Type: Point to multipoint

TEI Management: auto

Fixed ISDN B To GSM Channel

☒ Free Assignment

☐ Fixed Assignment

Reason Code: 16

PH Disact - When checked, this setting establishes that the ISDN Layer 1 is deactivated (disabled) when there are no active calls. The Layer 1 of ISDN protocol is the Physical connection.

Usually this box should be left unchecked, the inactivation of the physical layer or the connection may be required in some instances when synchronization error could occur otherwise.

Please note that not all ISDN phone exchanges support the disabling of the physical layer!

Send "Alerting" messages - By default it is checked, so alert messages are set out, as it is normal. But some PABX do not accept this, so you can un-check this box, and alerting messages will no longer be sent out.

Connection Type - refers to the ISDN connection.

Connection Type: Point to point

TEI Management: Point to point, Point to multipoint

As explained for the TE interface, you must select this according to the type of the equipment (digital PBX or telephone) that TOPEX ISDN gateway is connected to.

Available options are "Point to point" (default) and "Point to Multipoint". The Point-to-Point is used to connect only two devices, and it uses the DDI service (Direct Dialing In).

You should use this in the most usual case, when TOPEX ISDN gateway is connected to an ISDN phone exchange. But when you have the TOPEX ISDN gateway unit connected to one or several ISDN phones or modem, you can no longer use the Point-to-Point.

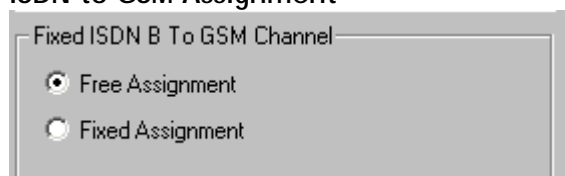
Instead, you must use the option "Point-to-Multipoint", which allows you to connect several ISDN equipments (from two up to eight). Instead of DDI, it uses the MSN service (Multiple Subscriber Number). The "Point-to-Multipoint" connection should be used for ISDN phones or other ISDN terminals.

TEI Management - establishes the administration of TEI.

"Terminal Equipment Identification" is an internal ISDN identification of connected phones. Allowed values are "0" or "auto", and this is related to the previous setting - the type of ISDN connection. For the default point-to-point connection, a value of "zero" must be used for TEI. (It can be changed only in exceptional cases.)

If you select "Point to multipoint" as connection type, you can see that the "TEI Management" field automatically switches to "Auto", which is the value that must be used for the Point to multipoint ISDN connection.

ISDN to GSM Assignment



This panel establishes the allocation of the two "B" voice channels of the ISDN link. By default, it is set to Free, meaning the assignment of ISDN calls to GSM modules is free (it will be established by the Routing table of MobiLink).

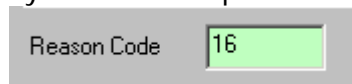
If you select instead "Fixed assignment", the allocation of ISDN voice channels to GSM modules will be fixed, established by the ISDN setup message. This message may tell "always assign channel 1 to GSM module 0". In this case, the routing table no longer matters, all calls coming in from ISDN are processed only according to the setup messages, which are issued by the PBX. You may choose this mode of operation when you don't want to bother with configuring the routing table on MobiLink, while on the PBX connected to TOPEX ISDN gateway you must always configure properly the routing rules.

Reason Code



Here you may enter a value for the "reason code" to be used.

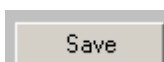
If an outgoing call from the PBX to the TOPEX ISDN gateway has failed because "no circuit/channel available (cause 34)", then the cause that will be sent to the PABX is replaced by the one set up from the OAM program, such as code 16 in the example below:



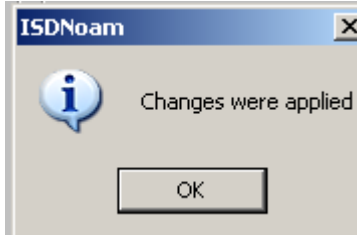
If you leave this field empty, as it is by default, no replacement of the release code will occur.

This feature may be required in case of some PABX that, when they receive an error message with cause 34, will isolate the respective trunk, so you must replace the cause 34 with another one.

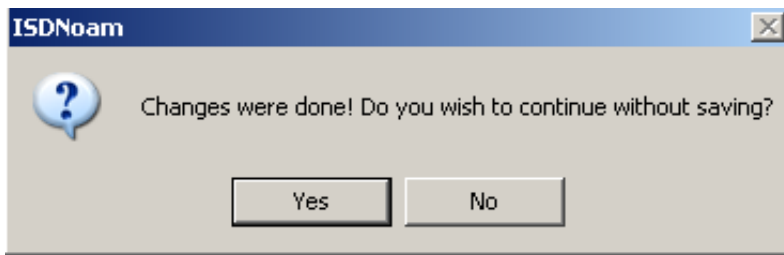
Save - save the modifications.



Finally, use the "Save" button located to the right of the ISDN cfg panel to save the changes. By pressing this button, you send the new settings to the TOPEX ISDN equipment, which sends you back a confirmation message:



If you forget to click Save, there is no risk of the changes not being saved - the OAM program warns you about this, by reminding you that you have made changes, but they are not saved:

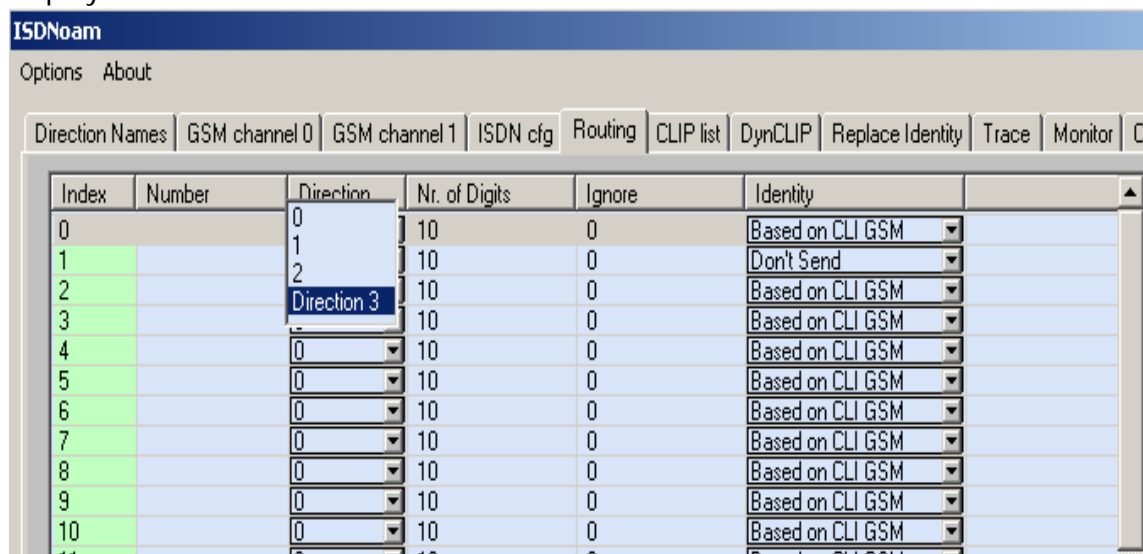


Now, if you want to discard the changes you performed, click Yes. Should you want to keep the changed settings, click No to go back to the previous page and use the Save button!

Warning: *after performing changes to the TE or NT interface you should reset the equipment if you want your settings to be valid. The new values for the parameters will be enabled only after a RESET. To perform a reset of the ISDN-2-UMTS unit, pull out the power supply jack. Wait at least ten seconds, then plug the jack back in. The TOPEX ISDN GATEWAY will start working with the new parameters.*

8.4 Routing Table

By selecting the "Routing" tab in the title bar" the window for defining routing rules will be displayed:



The routing table is a collection of maximum 50 records, each records containing:

- **index** (colored in light green to indicate that is not editable), the indexes are from zero up to 49;
- **number** (the prefix - the number for which a certain direction will be chosen.

11	077	Orange
12	089	Direction 3
13	1234567890	PSTN
14	111111111111	Direction 3
15	888888888888	PSTN
16	x	PSTN

The total length of the "Number" field is 12 digits, if you try to enter more than 12 digits, they will be simply ignored.

The allowed characters for this field are digits from '0' to '9' plus the keypad symbols "#" and respectively "*", which have special usage as explained further on referring to the "Identity" column.

Also, you can insert in whatever position inside the telephone number the characters 'x', which will be interpreted by the ISDN-2-UMTS system as "any digit".

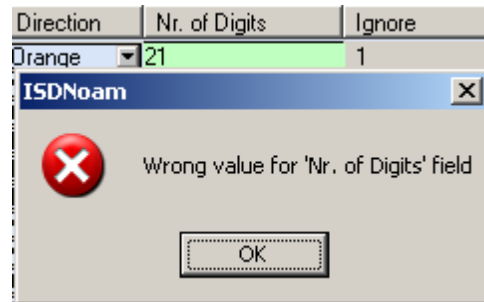
- **direction** - the direction (four possible values, defined in "Direction Names" to which the call with the prefix specified in the "Number" field will be routed.

Number	Direction	Nr. of Digits
#074	Orange	11
*072	Vodafone	11
*074	Orange	11
021	PSTN	10
097	Direction 3	10

- **number of digits** - this is the number of digits expected to be received before forwarding the call through a resource.

Typically, the number of digits is from 10 to 12 for most mobile or PSTN telephone networks.

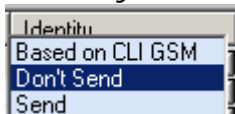
In case of a local subscriber of the PBX, the number of the respective extension is 2, 3 or 4 digits long. The maximum value for the number of digits is 20, if you enter a larger number you will get an error message like this:



In Romania all the mobile networks always use the **same length** for its phone numbers - ten digits. Thus the parameter "Nr. of Digits" can be set to this length. This causes the TOPEX ISDN gateway to send the outgoing call immediately after that number of digits have been received, without waiting for time out specified by **Dial Timeout**.

- **ignore** - the number of digits to be **ignored** from the received number. By default it is zero, meaning no digits are ignored. But you may set it to 2, causing the first two digits to be ignored. This is useful to establish specific Identity behavior, or when assigning higher priority for certain outgoing calls. In this case, the phone exchange inserts a „dummy" digit at the beginning of phone numbers dialed by the high priority extension. The two mobile modules are in this case assigned to the same carrier, but one of them is reserved for the numbers dialed by the local subscribers with high priority. But the first digit is a „dummy" (false one), so in the Routing Table you must specify „Ignore 1", in order to ignore the first digit, which has been used only internally, to assign a higher priority. Another example of „ignore" usage is when you want certain numbers to send or not the Caller ID, using the next field, Identity.

- **identity** - rule for managing the identity of each outgoing calls.



There are three options you can select: „Based on CLIP GSM" (default), „Don't Send" or „Send".

As described previously at „GSM channel", you can specify CLIP or CLIR when configuring a GSM module, but this will affect in the same way **all** of the calls made over the respective module, it is a general setting. Suppose that you want to selectively send out or not the ID. Use the column „identity" together with the rules for routing and Ignore:

Direction	Nr. of Digits	Ignore
Orange	21	1

Direction Names	GSM channel 0	GSM channel 1	ISDN cfg	Routing	CLIP
Index	Num...	Direction	Nr. of ...	Ignore	Identity
0	#074	Orange	11	1	Don't Send
1	*072	Vodafone	11	1	Send
2	*074	Orange	11	1	Send
3	031	PSTN	10	0	Send
4	033	Direction 3	10	0	Based on CLI GSM

Rule 0 - the prefix 074 that is starting with the „#" character will be routed through the GSM module assigned on the direction Orange, as normal, and the first „dummy" character will be ignored. The column Identity says in this case „Don't send".

Rule 2 - the prefix 074 that is now beginning with the „*" character will also be routed through the GSM module assigned on the direction Orange, and the first „dummy" character will be ignored. But now the column Identity says „Send". What does this mean?

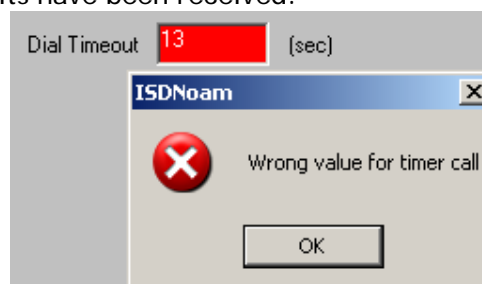
When a user of TOPEX ISDN gateway (a local subscriber) wants to get out via the Orange mobile network **without** sending out the identity, he will dial a „#" at the beginning of the requested phone number. Should he want to send the Caller ID, he dials a „*" character before the number, instead of the „#".

Dial Timeout

At the bottom of all tables you can see the field "Dial Timeout".

After reaching the number of seconds you have entered here, TOPEX ISDN gateway will sent out the phone number towards GSM, even if not all the digits have been received.

Allowed values are from 1 to 12, if you type another value you will see an error message with the field Timeout colored in red:



Usage:

"Dial Timeout" is the interval between dialing of the last digit of the telephone number and the sending out of the call through the mobile network. This interval should be normally set to about 6 seconds. If you want to reduce the duration between dialing the last digit and hearing the dialing tone you may set a lower value for Dial Timeout. It can be reduced to as low as one second, but this is dangerous, the call may get out before you finished dialing the number!

When making an outgoing call, the TOPEX ISDN gateway will wait until the dialing of the requested number is completely terminated. Waiting for completion can generate a certain delay between dialing of mobile number and actual selection. If this is annoying, you may set the option "Number" accordingly to destinations most frequently called. Then, for these records, the Topex box will dial **immediately** (as soon as it receives the last digit), without waiting anymore.

The resource (port) is allocated to the direction specified in the "Direction" field (the maximum value allowed is 20).

Editing and saving

You may edit each field from the columns "Number", "Direction", "Nr.of Digits", "Ignore" and respectively "Identity" (columns colored in light blue).

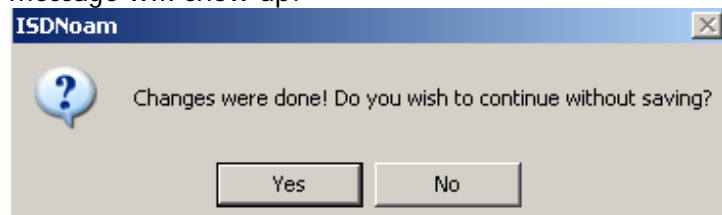
You must point with the mouse on the field that you want to modify. That field will be highlighted with a black rectangle indicating that it may be edited. There is no need to press "Enter", when you go to the next field, the value entered will be saved.

You can delete or add characters.

If you want to save the new value, press the <ENTER> key; if you want to preserve the old value, press the <ESC> key instead.

If the value is not correctly filled in, a message error ("Wrong value") will be displayed

The "Save" action is used to load all the records into the TOPEX ISDN gateway system that is connected. Here also, if you make changes but forget to press the "Save" button, a reminder message will show up:



Before the loading process, *all the records are sorted in ascending order.*

Direction Names	GSM channel 0	GSM channel 1	ISDN cfg	Routing	CLIP list	DynCLIP	Replace Identity	Trace	Monitor	CDR	SMS	Terminal
Index	Number	Direction	Nr. of Digits	Ignore	Identity							
0	#074	Orange	11	1	Don't Send							
1	*072	Vodafone	11	1	Send							
2	*074	Orange	11	1	Send							
3	031	PSTN	10	0	Send							
4	033	Direction 3	10	0	Based on CLI GSM							
5	039	Direction 3	12	0	Based on CLI GSM							
6	072	Vodafone	10	0	Based on CLI GSM							
7	073	Vodafone	10	0	Based on CLI GSM							
8	0742	Orange	10	0	Based on CLI GSM							
9	076	Orange	10	0	Based on CLI GSM							
10	0765	Orange	10	0	Based on CLI GSM							
11	077	Vodafone	10	0	Based on CLI GSM							
12	089	Direction 3	10	0	Don't Send							
13	089898989898	Vodafone	11	1	Send							
14	111111111111	Direction 3	10	0	Based on CLI GSM							
15	1234567890	PSTN	10	0	Based on CLI GSM							
16	309308890898	Orange	10	0	Based on CLI GSM							
17	3465	Vodafone	10	0	Based on CLI GSM							
18	888888888888	PSTN	10	0	Based on CLI GSM							
19	x	PSTN	10	0	Don't Send							
20		Vodafone	10	0	Based on CLI GSM							
21		Vodafone	10	0	Based on CLI GSM							
22		Vodafone	10	0	Based on CLI GSM							
23		Vodafone	10	0	Based on CLI GSM							
24		Vodafone	10	0	Based on CLI GSM							

Dial Timeout (sec)

Save

In case when you are working Offline ("Options-View Config File") the Routing table looks the same, but there is no "Save" button to the right. This means you can only view the routing rules, no edit action can be performed in this case.

8.5 CLIP-GSM Table

If you click the table "CLIP list in the row of tabs at the top of the OAM screen, the window for editing the CLIP list records will be displayed:

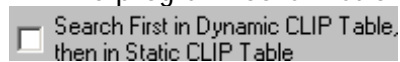
Direction Names	GSM channel 0	GSM channel 1	ISDN cfg	Routing	CLIP list	DynCLIP	Replace Identity	Trace
Index	Number	Action	Type	Target / Nr. of Digits	Callback			
0	0741997186	NT	TARGET	105	<input checked="" type="checkbox"/>			
1	0721132538	NT	DISA	3	<input checked="" type="checkbox"/>			
2	031999999	TE	DISA	10	<input checked="" type="checkbox"/>			
3	0765455810	NT	DISA	3	<input checked="" type="checkbox"/>			
4	032999999	TE	TARGET	105	<input checked="" type="checkbox"/>			
5	0765455810	NT	TARGET	120	<input checked="" type="checkbox"/>			
6		none	TARGET	---	<input checked="" type="checkbox"/>			
7		none	TARGET	---	<input checked="" type="checkbox"/>			
8		none	TARGET	---	<input checked="" type="checkbox"/>			
9		none	TARGET	---	<input checked="" type="checkbox"/>			
10		none	TARGET	---	<input checked="" type="checkbox"/>			
11		none	TARGET	---	<input checked="" type="checkbox"/>			
12		none	TARGET	---	<input checked="" type="checkbox"/>			
13		none	TARGET	---	<input checked="" type="checkbox"/>			
14		none	TARGET	---	<input checked="" type="checkbox"/>			
15		none	TARGET	---	<input checked="" type="checkbox"/>			
16		none	TARGET	---	<input checked="" type="checkbox"/>			
17		none	TARGET	---	<input checked="" type="checkbox"/>			
18		none	TARGET	---	<input checked="" type="checkbox"/>			
19		none	TARGET	---	<input checked="" type="checkbox"/>			
20		none	TARGET	---	<input checked="" type="checkbox"/>			
21		none	TARGET	---	<input checked="" type="checkbox"/>			
22		none	TARGET	---	<input checked="" type="checkbox"/>			

Timer Callback (sec)

The Static CLIP table has several uses: to allow special GSM numbers to call back, to configure a default number different from that in the GSM channel settings, or to filter out calls (prevent certain callers from calling specific destinations).

The incoming calls are treated according to their ID (originating number), in several steps:

-The program looks first of all in the **Dynamic CLIP table**. If there the checkbox



"Search first in dynamic CLIP table and after that in static CLIP table" is **not** enabled,

- the program goes to the current table, CLIP list (static). The table with CLIP list is checked for the received identity;
- If the identity is not found in the Static CLIP table then the programs goes to the Dynamic CLIP table;
- If the ID is not found in this table also, the GSM settings (see **Call handling panel**) will be analyzed.

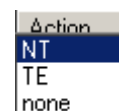
The static CLIP table is a collection of maximum 50 records, each records containing:

- Index (0 to 49, colored in light green to indicate that is not editable)
- Number (the identity, phone number for which a certain "Target" will be selected.

Index	Number	Action
0	0741997186	NT
1	0721132538	NT

The total length of the "Number" field is 14 figures. The allowed values are digits from '0' to '9'.

- Action, list of actions to be performed; allowed values are "NT", "TE" and "none". The default is "none".



If you select "none" action for a line then the number (identity) specified on that line will make no action. Values "NT" and "TE" are used in the same manner as for the mobile modules settings.

The functionality is specified from the "Type" list and the target for the call is filled in the "Target / Nr. of Digits" field.

Number	Action	Type	Target /...	Callback
0741997186	NT	TARGET	105	<input checked="" type="checkbox"/>
0721132538	NT	DISA	3	<input checked="" type="checkbox"/>
031999999	TE	DISA	10	<input type="checkbox"/>

The last column, "Callback", contains checkboxes. If a box is checked, the **callback feature** is enabled for the respective phone number. This means the mobile phone number will be called on request. The callback can be initiated by a call from a mobile customer which is out in the field. The TOPEX ISDN gateway rings him back, the GSM user accepts the call and either gets a DISA dial tone so he can dial a number to one of the allowed destinations, or he is connected directly to the number you have set up in the column "TARGET".

For the boxes that are not checked, the incoming calls will be treated according the CLIP table. For instance, the calls from a certain mobile number are from a technician in the field, so he will always be routed to the local extension of the Support department, while the phone call of the courier will receive DISA tone, so he may call whatever office he needs.

4	032999999	TE	TARGET	105	<input type="checkbox"/>
5	0765455810	NT	TARGET	120	<input checked="" type="checkbox"/>
6	12345678901...	NT	TARGET	110	<input type="checkbox"/>

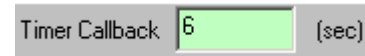
If "TARGET" is selected from the "Type" list then an ISDN SETUP message will be sent through the ISDN interface specified in the "Action" list, having as called party number the with the number read from the "Target" field. In the example above, the targets are three-digit local extensions such as 105, 110, 120, etc.

1	0721132538	NT	DISA	3
2	031999999	TE	DISA	10

If "DISA" is selected from the "Type" list instead of Target, then the call will be answered and an ISDN SETUP message will be sent through the ISDN interface specified in the "Action" list. The setup message may include or not the called party number. The fore last field contains now the "number of digits" for DISA action, either 2-4 for a local extension or 9-12 digits for an external phone number.

Timer callback

At the bottom of the CLIP list screen, enter the time interval:



This field, located at the bottom of the screen "CLIP list", decides how the call-back feature works. There are two different scenarios: you can type either a normal time value or the value zero. For this field, "a normal time value" is from six seconds up to twelve seconds, a lesser value for the callback timer makes no sense.

- When you enter a normal time value:

If the value typed in the field "Timer callback" is in the range of 6 to 12 seconds, the callback timer makes the difference between a forwarded call and one managed with callback: if you ring, then you end the call before this timer expires, it will be treated as a ring - back call. But if you continue to ring for more than six seconds (value shown in the above example), then the call will be connected, and routed according to the setting in the field "type". This way, from a same mobile number the remote user may choose either to be called back or to get connected directly, depending how long he ring.

- When you choose to enter the value zero:

Now the callback timer is no longer used to make the difference between a forwarded call and one managed with callback, the incoming call is instantly rejected anyway and MobiLink rings back the remote user.

It operates like this:

- the mobile user in the field calls the number of the SIM card used in MobiLink ISDN;
- MobiLink ISDN rejects the call, the remote user hears busy tone;
- MobiLink ISDN makes a call to the respective phone number;
- The remote caller answers, hears call-back tone;
- Depending on your setting in "Type", MobiLink ISDN either provides DISA dial tone to the remote user, allowing him to dial a local extension or rings the local extension whose number you have entered in the field Target;
- When the local extension answers, he is connected to the remote user who called in first place.

Note that in this mode of operation, the back call to the mobile subscriber in the field is initiated immediately, no matter whether the local extension has answered or not!

Callback operation

When DISA is selected as "Type", the caller party rings and hangs up before the Timer Callback expires. TOPEX ISDN gateway calls back and provides a DISA-like dial tone, allowing the remote caller to dial a local extension of the PBX.

When in the field "Type" you select TARGET instead of DISA, the caller party also rings and hangs up. Topex ISDN2GSM initiates a call to the remote GSM/UMTS subscriber which has called first. When he answers, he gets call-back tone. Now Mobil ink makes a local call to the TARGET extension. The local extension picks up the phone and is connected with the remote GSM/UMTS subscriber who has called in first place.

All other incoming calls with the missing Caller ID or with identity not found in the CLIP table will be routed accordingly to the 2G/3G module settings: for example to the Operator of your PABX.

Also, when you have set a normal value for the timer, if the ring lasts longer than the "Timer Callback" value, the call will NOT be treated as a callback one.

In the "CDR" list, which saves all the details of the calls, you may see in the field Source the origin of the call - instead of the usual GSM0 or GSM1, it will be GSMx-cbd or GSMx-cbt.

If the calling number has been set as target, you will see **GSMx-cbt** that means "callback target", while when it been configured for DISA, it will show **GSMx-cbd** meaning "callback DISA", as you can see in the examples below:

08-04-09,13:34:37	GSM0-cbd	076
08-04-09,13:34:37	GSM1	074
08-04-09,13:36:04	GSM0-cbt	076

And respectively:

13-04-09,10:29:19	GSM0	037
13-04-09,10:30:41	GSM0-cbt	076

Note: If in the column "Type" you have "DISA" then the meaning of the field "Target / Nr. of Digits" is different: instead of intended target, you will have "Nr. of Digits", the maximum number of digits that are waited from the mobile network.



You may specify at most 20 digits.

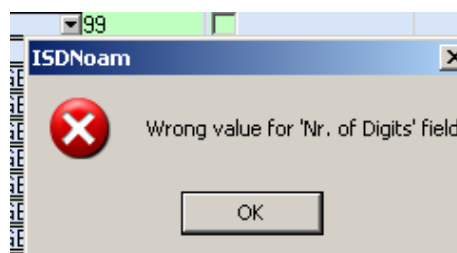
If you enter "0" for this field, it means **no digits will be waited for** from the mobile network. The ISDN SETUP message will be sent without any called party number in it.

You may edit each field from the columns colored in light blue. You must point with the mouse on the field which you want to modify. That field will become light green and will be highlighted with a black rectangle, indicating that it can be edited:



You can delete or add characters. If you press the <ENTER> key the new value will be saved, if you press <ESC> key the old value will be preserved.

If the value you filled in is not correct, an error message ("Wrong value") will be displayed, like this one for entering 99 as number of digits:



You can select values for the fields "Action" and "Type". Those fields are displayed as combo-box fields.

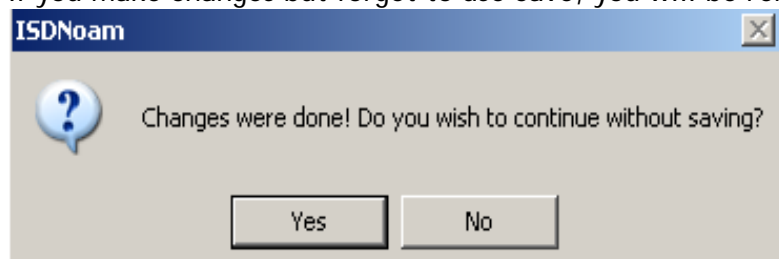
When you finished editing the CLIP table, you must send the new settings to the TOPEX ISDN gateway. The "Save" button is used to load the modified records into the TOPEX ISDN gateway.

48	498026391	NT	TARGET	198		
49	0197856453291	TE	DISA	3		

Timer Callback (sec)

Save

If you make changes but forget to use Save, you will be reminded by the warning:



8.6 Dynamic Clip

The Dynamic CLIP list is created by the equipment, based on the calls that were performed through the ISDN gateway. You have not write entries in this list, they are created *automatically*, according to the rules defined by you.

Also, as its name suggests, it is a *dynamic* table, the rows of this table do not remain forever, they are updated according to the situation.

You must only set up the rules in the panel "Category" located to the right:

Index	Number	Action	Target	NrCalls
0	0741999999	TE	201	8
1	0741000000	TE	202	11
2	0741000001	TE	120	11
3	0790000000	NT	207	10
4	0765000000	NT	105	8
5	0724000000	NT	119	9
6	0732056277	TE	204	8
7	0761099999	TE	202	10
8		none	---	0
9		none	---	0
10		none	---	0
11		none	---	0
12		none	---	0
13		none	---	0
14		none	---	0
15		none	---	0
16		none	---	0
17		none	---	0
18		none	---	0
19		none	---	0
20		none	---	0
21		none	---	0
22		none	---	0
23		none	---	0
24		none	---	0

Category

- ☒ Search First in Dynamic CLIP Table, then in Static CLIP Table
- ☒ Store unanswered calls in Dynamic CLIP Table
- ☐ Store answered calls in Dynamic CLIP Table
- ☒ Remove records from Dynamic CLIP based on time (enabled) or number of calls (disabled)

Time

This feature is working based on:

- validity period - the time interval (specified in hours) - when the validity period of a dynamic CLIP record is passed - the record is deleted
- number of calls - the record is valid when the number of calls is not zero. After each call coming from GSM from the number specified in the record, the number of calls is decremented by 1.

Possible settings are:

- search first in dynamic CLIP table and after that in static CLIP table;
- two options are related to keeping the unanswered calls / answered calls in dynamic CLIP table; this options are allowing the dynamic CLIP table;
- the records are removed based on time when the last checkbox is enabled or based on number of calls when the option is disabled.

Save

Purpose

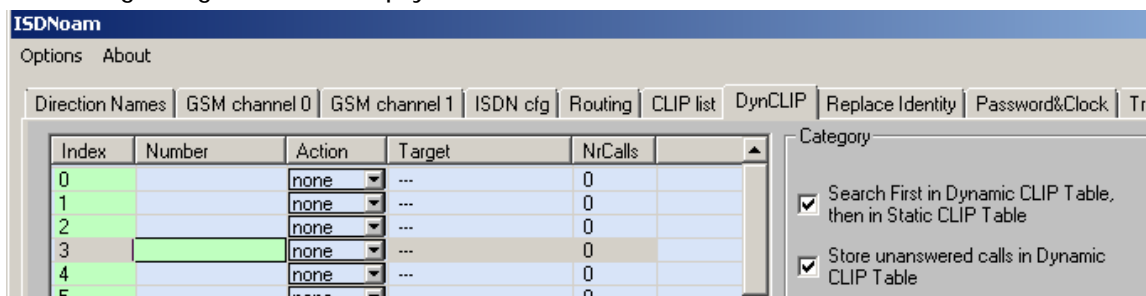
The feature Dynamic CLIP was designed to fix the ID issue that arises for calls made through mobile gateways.

First, the called party cannot see the real phone number of the calling party; instead he just sees the number of the SIM card for the GSM module used. If the call is not accepted, or the called party was busy, when the called party tries to ring back to the number that shows up in „missed calls“, he will reach only the GSM module of the ISDN-2-GSM gateway and he cannot be connected to the PBX or to the human operator.

He does not have information about the **real number** of the calling party, he does not know from what local extension he was called.

To overcome this problem, outgoing calls made through the mobile modules of the ISDN gateway are stored in the Dynamic CLIP table as they are made.

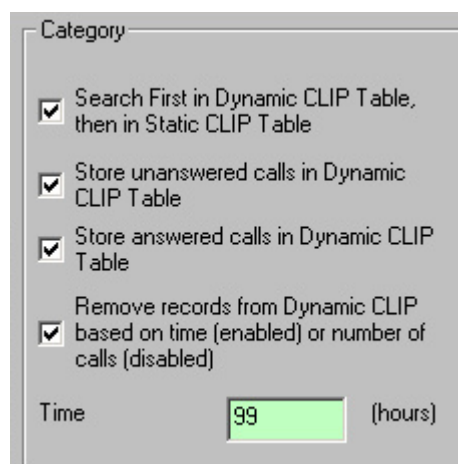
In the beginning the list is empty:



Then, as calls are performed via MobiLink, the dynamic clip list is filled with lines indicating the mobile number that was called, via which interface (NT or TE), what was the target (local extension numbers, such as 201, 202, 204 120 in the examples below):

Index	Number	Action	Target	NrCalls
0	0741999999	TE	201	8
1	0741000000	TE	202	11
2	0741000001	TE	120	11
3	0790000000	NT	207	10
4	0765000000	NT	105	8
5	0724000000	NT	119	9
6	0732056277	TE	204	0
7	0761099999	TE	202	0

To control this automatic list, you have the panel „Category“ located to the right. It lets you set the parameters for the table of dynamic CLIP records.



These settings control the processing of a back call from the user that was not reachable.

When a call to a GSM party can not be established, the ISDN gateway stores the number of called party together with the calling party number (normally a local extension of the PBX, like 201 or 120) in the dynamic list. When a call comes in from the mobile network, the equipment

looks for the calling party number in this list. If an entry is found, the call will be directly connected to the stored extension.

Persistence

To avoid flooding the dynamic CLIP list with entries, the records that are generated automatically, are not kept forever, they are erased after a while.

This “cleaning” feature works based on different rules defined by you:

- validity period - you specify a time interval (in hours). When the validity period of a dynamic CLIP record is over, the respective record is automatically deleted;
- number of calls - You set up a limit for the number of calls. The record is valid while the number of calls is not zero. After each incoming GSM call from the telephone number specified in the record, the “number of calls” counter is decremented by one.

You can configure the duration that an entry should remain in the Dynamic Clip list with the option “**Remove records from Dynamic CLIP based on time**”. If there is no back call inside this time period, the entry in the list is deleted. Another automated removal option is based on number of calls performed. These two auto-removal options are joined in a single checkbox:

If the box it is **marked**, the removal will be done based on time, the field below says “**Time**” and you enter the number of hours, such as 99

Remove records from Dynamic CLIP
☒ based on time (enabled) or number of calls (disabled)
 Time (hours)

Remove records from Dynamic CLIP
☐ based on time (disabled) or number of calls (enabled)
 Number of Calls

When the option is **disabled**, the removal is done according to the **number of calls**, and the field underneath says now “**Number of calls**”, with a value of 19 here

A new call made to the same mobile number overwrites an older entry in the Dynamic CLIP list.

Order of search

In “Category” you also have these settings:

- “**Search first in dynamic CLIP table and after that in static CLIP table**”. When you check this box, the program running on the equipment will look first in the list of dynamic clip, and afterwards in the static CLIP table. If you let this checkbox unmarked, the program will look at first in the static Clip table

This is important since some telephone numbers can show up in **both** tables, you must define the priority of search.

Selection of calls stored

Two more separate options allow you to decide what kind of calls will be stored in the dynamic CLIP table. You may select either only calls that were **not answered** at destination, or only the answered calls, or **both** types of outgoing calls;

<input checked="" type="checkbox"/> Store unanswered calls in Dynamic CLIP Table	<input checked="" type="checkbox"/> Store unanswered calls in Dynamic CLIP Table
<input type="checkbox"/> Store answered calls in Dynamic CLIP Table	<input checked="" type="checkbox"/> Store answered calls in Dynamic CLIP Table

See below an example of calls stored in the Dynamic list when checkboxes in "Category" have been marked:

Index	Number	Action	Target	NrCalls
0	0741999999	TE	201	8
1	0741000000	TE	202	11
2	0741000001	TE	120	11
3	0790000000	NT	207	10
4	0765000000	NT	105	8
5	0724000000	NT	119	9
6	0732056277	TE	204	8
7	0761099999	TE	202	10
8	0732056277	TE	208	4
9	0740999999	NT	108	8
10	0740999999	NT	124	8
11	0741000000	TE	202	9
12	0732999999	NT	124	7
13	0722222222	NT	120	6
14	0722222222	NT	128	6
15		none	---	0

Category

☒ Search First in Dynamic CLIP Table, then in Static CLIP Table

☒ Store unanswered calls in Dynamic CLIP Table

☐ Store answered calls in Dynamic CLIP Table

☒ Remove records from Dynamic CLIP based on time (enabled) or number of calls (disabled)

Time:

This feature is working based on: update period - the time interval (specify)

You can also edit the Dynamic Clip List, manually entering the mobile number, the action to be taken, and the target. This useful, for instance, when you expect a customer or an agent in the field to call you in a certain time interval

11	0741000000	TE	202	8
12	0732999999	NT	124	6
13	0722222222	NT	120	5
14	0732000000	TE	205	2
15		none	---	0

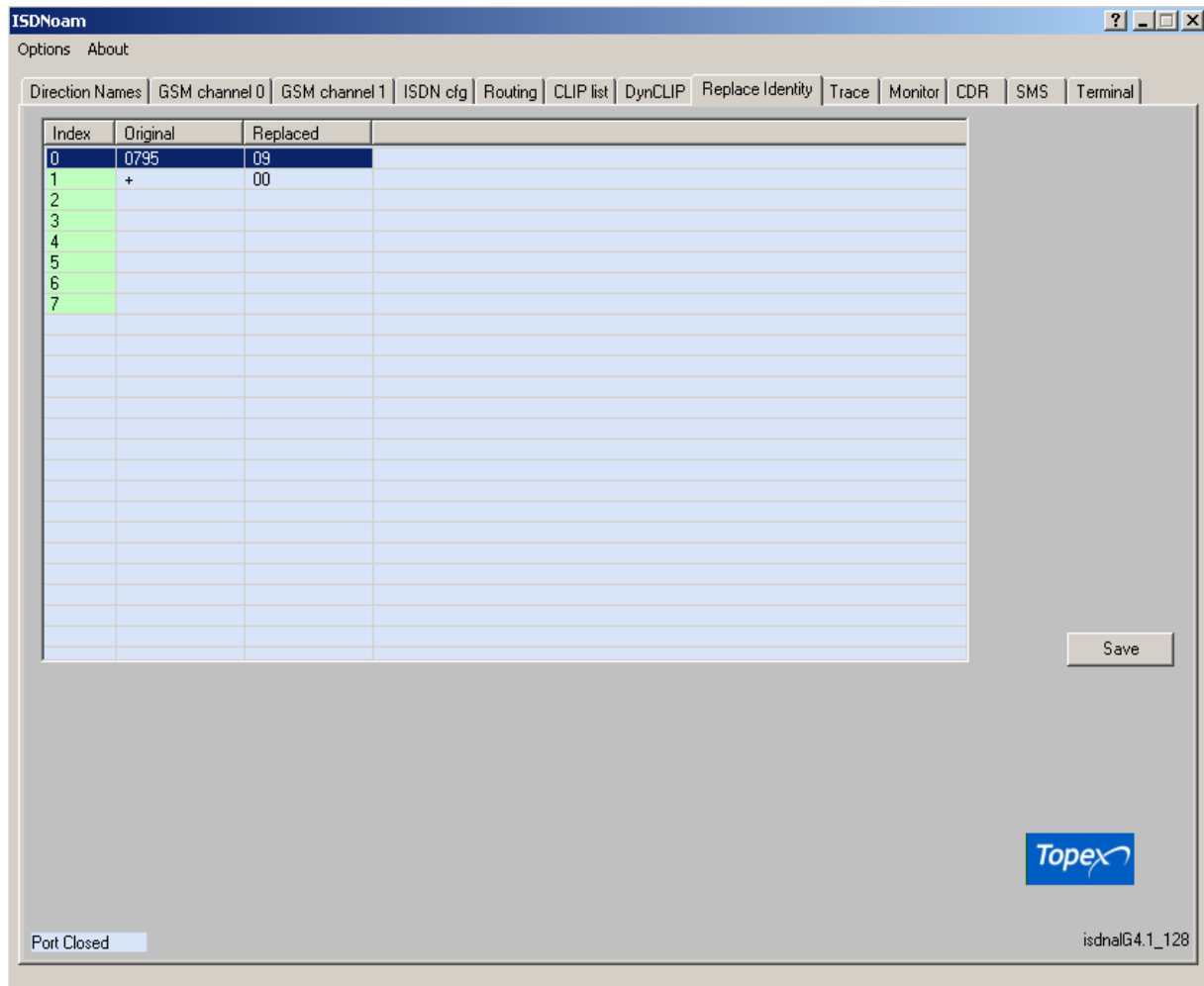
Remove records from Dynamic CLIP based on time (enabled) or number of calls (disabled)

Time: (hours)

When you edit line 14 as shown in the example above, the effect will be "when the mobile number 0732000000 calls in the next two hours, it will be connected directly to the TE interface, to extension number 205".

8.7 Replace ID

Click on the "Replace Identity" tab to open the screen for replacing the received identity of calls.



This table stores rules for replacing some IDs.

There are three columns:

- First, the index (from zero up to 7), not editable (green), so you can define max. eight records,
- original identity code
- and respectively Replaced identity.

You can use the table to replace the identity of the incoming calls according to your needs.

For example, there are situations when the calls coming in from GSM networks have their identity shown with full country code and the "plus" sign: +33, +4076, etc.

Also, suppose your PBX remembers missed calls and can redial them automatically. But *in ISDN only digits are accepted, not the "+" sign or other characters*.

So in order to fully use the facilities of your PBX, you need to eliminate the plus sign from the ID of incoming calls (this means replacing +0 with 0).

Also, you may use the "replaced identity" feature to differentiate between numbers from inside the country and international numbers. Thus, you will enter two rules in the table for editing the replaced identity:

1. "+countrycode" will be replaced by one zero, "0", as in country calls
2. "+" will be replaced by two zeroes, "00", as in international calls

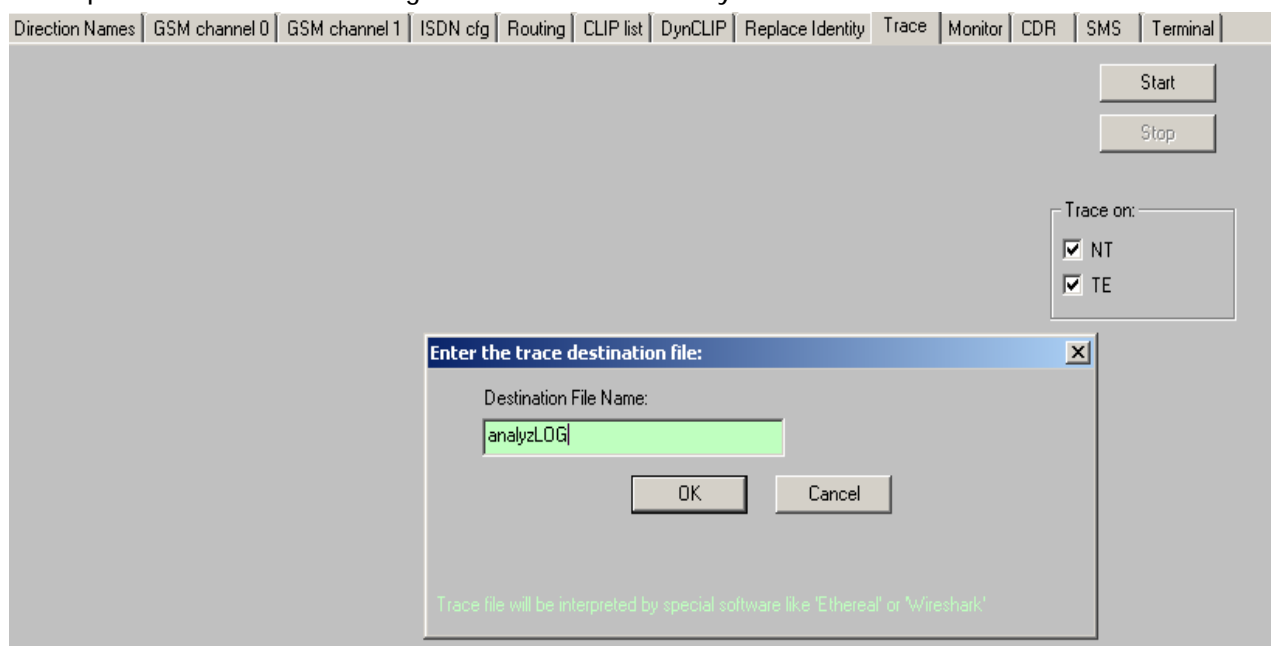
You may add also other rules for replacing the ID, according the requirements of your call routing needs.

For instance, the example above works like this: phone numbers beginning with "0795" will have these digits replaced with the prefix "09", while the numbers starting with a "+" will get instead two zeroes.

This is the **default setting**, and it is used because several fixed or mobile telephony providers send out an identity (phone number) 'that begins their numbers with a "plus" sign (+40765..., +40724..., +4021...etc) while most ISDN systems do not accept the "plus" symbol, so it must be replaced.

8.8 TRACE

This option is used for enabling advanced trace facility on the TE and NT interfaces.



It is a debug feature which is more detailed than Monitoring, it logs every data and messages exchanged over the ISDN interfaces.

In the box "Trace on:" you must mark the checkboxes for the interface that you want to - NT, TE or both.

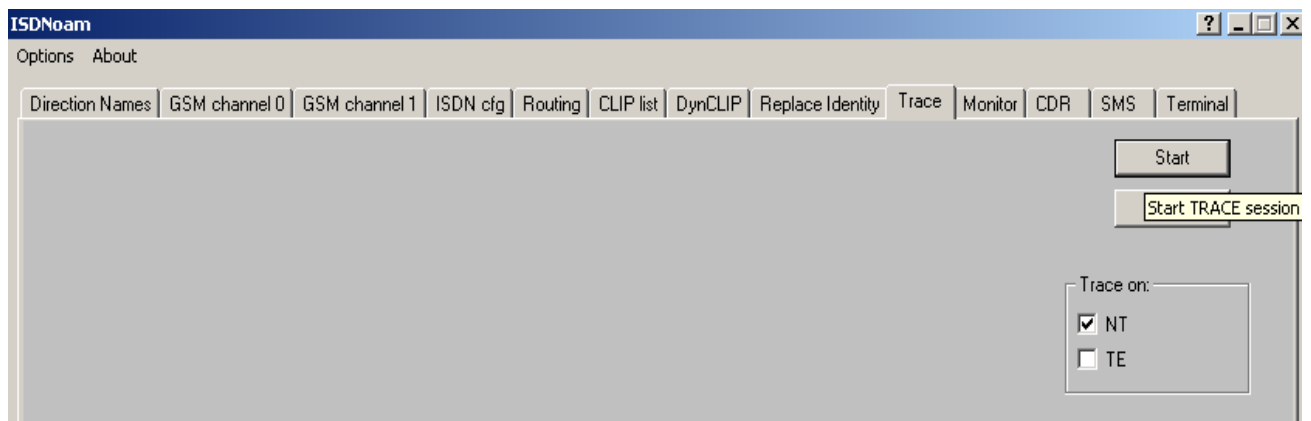
Then press the Start button.

A window pops up, asking you to "Enter the trace destination file". Type the name you want to assign to the tracing file, then click OK. The tracing operation begins!

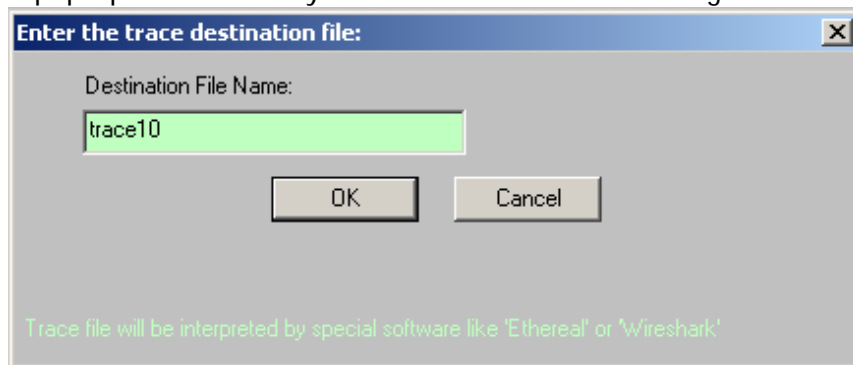
On the HDD of the computer where OAM application is running, a detailed log file will be created, with the name that you typed in the field "Destination File Name".

The Trace-ing action is running until you click the Stop the first disconnect between OAM software and the TOPEX ISDN GATEWAY equipment. Later, the log files can be analyzed by means of the "Network protocol analyzer" applications such as Ethereal or Wireshark.

See below an illustration of the situation when “TRACE” has been enabled on the NT interface:



A pop-up window asks you for the name of the tracing file:

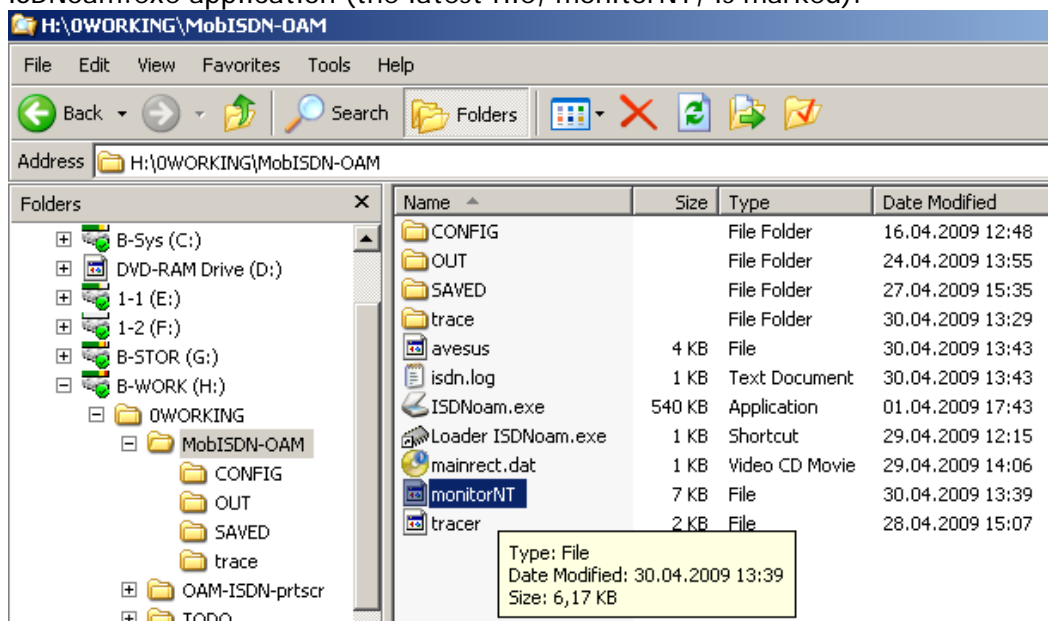


After you press OK, the tracing action is indicated by the red “Port Opened” indication at the bottom left corner of the OAM screen:

Port Opened

8.8.1 Trace Files

By default, the trace files are stored in the root of the folder where you have placed the ISDNoam.exe application (the latest file, monitorNT, is marked):



If you use a lot the trace function, and thus many tracing files are created, it is recommended to create a dedicated sub-folder for these files, in order to keep clear the root folder. The folder "trace" shown below contains several tracing files generated during March and April:

MobISDN-OAM\trace

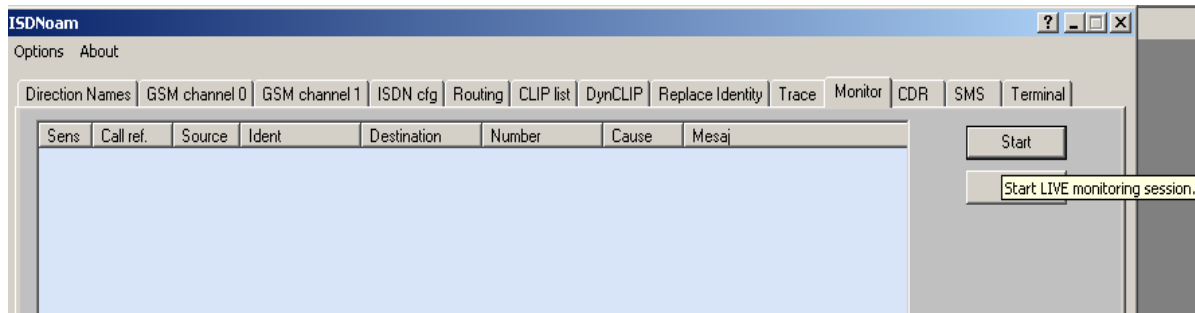
Name	Size	Type	Date Modified
34c	4 KB	File	19.03.2009 18:11
akagi	1 KB	File	21.04.2009 16:51
algot	6 KB	File	01.04.2009 18:45
alkons-2apr	9 KB	File	02.04.2009 11:15
altrace-z	10 KB	File	27.03.2009 11:24
analyzLOG	16 KB	File	06.04.2009 17:28
apel-test	3 KB	File	08.04.2009 12:39
aurel	1 KB	File	19.03.2009 17:08
call	10 KB	File	23.03.2009 11:00
deactivation	10 KB	File	07.04.2009 18:25
full	5 KB	File	19.03.2009 18:27
full-log	62 KB	File	25.03.2009 15:19
isdn1.log	7 KB	Text Do...	19.03.2009 17:38
list-TE	9 KB	File	01.04.2009 18:09
logTEL	1 KB	File	18.03.2009 18:29
logtrace3	3 KB	File	01.04.2009 11:22
trace-ambele	8 KB	File	02.04.2009 17:41
traseO2	24 KB	File	30.03.2009 13:50
trTELM	5 KB	File	19.03.2009 16:51
xemnira	50 KB	File	19.03.2009 18:10
zagreb	1 KB	File	19.03.2009 17:36
zalog	1 KB	File	22.04.2009 17:28

Viewing the trace logs

To view the trace files, you should use a network analyzer program, such as *Wireshark*.

8.9 Monitor

Should you want to view online the calls routed by the TOPEX box, just click the Monitor tab, to open the corresponding card file. In the beginning it is empty, press the Start button to launch the live call monitoring process. When the calls monitoring process is started, the icon of the button will be displayed in gray color.



The monitoring files are very detailed activity files, which record everything about the calls. They are generated to detail for you the mode of call setup and follow up for the calls from and towards the ports of TOPEX ISDN gateway. The monitoring of the calls can be stopped at any time by pressing the Stop button.

Direction Names	GSM channel 0	GSM channel 1	ISDN cfg	Routing	CLIP list	DynCLIP	Replace Identity	Trace	Monitor	CD
Sens	Call ref.	Source	Ident	Destination	Number	Cause	Mesaj			
In	3	NT	120	none		0	SETUP			
Out	3	NT	120	none		0	SETUP_ACK			
In	3	NT	120	none	0	0	INFORMATION			
In	3	NT	120	none	7	0	INFORMATION			
In	3	NT	120	none	3	0	INFORMATION			
In	3	NT	120	GSM0	2	0	INFORMATION			
In	3	NT	120	GSM0	0	0	INFORMATION			
In	3	NT	120	GSM0	5	0	INFORMATION			
In	3	NT	120	GSM0	6	0	INFORMATION			
In	3	NT	120	GSM0	2	0	INFORMATION			
In	3	NT	120	GSM0	7	0	INFORMATION			
In	3	NT	120	GSM0	6	0	INFORMATION			
Out	3	NT	120	GSM0		0	CALL_PROCEEDING			
Out	3	NT	120	GSM0		0	ALERTING			
In	3	NT	120	GSM0		16	DISCONNECT			
Out	3	NT	120	GSM0		16	RELEASE			
In	3	NT	120	GSM0		0	RELEASE_COMPLETE			
Out	3	GSM1	0740109531	NT	120	0	SETUP			
In	3	GSM1		NT		0	ALERTING			
In	3	GSM1		NT		0	CONNECT			
Out	3	GSM1		NT		0	CONNECT_ACK			
Out	4	GSM0-cbt	0765455810	NT	120	0	SETUP			
In	4	GSM0-cbt		NT		0	ALERTING			
In	3	GSM1		NT		16	DISCONNECT			
Out	3	GSM1		NT		16	RELEASE			
In	3	GSM1		NT		0	RELEASE_COMPLETE			
In	4	GSM0-cbt		NT		0	CONNECT			
Out	4	GSM0-cbt		NT		0	CONNECT_ACK			
Out	5	GSM1	0740109531	NT	120	0	SETUP			
In	5	GSM1		NT		0	ALERTING			
In	4	GSM0-cbt		NT		0	HOLD_REQ			
Out	5	GSM1		NT		16	DISCONNECT			
In	5	GSM1		NT		0	RELEASE			
Out	5	GSM1		NT		0	RELEASE_COMPLETE			

The Monitor table has the following fields (columns):

Sens - shows which way the call goes, it may be either IN or OUT.

Call ref - call reference number (1,2, ..6) from DSS signaling. This is especially important when two calls come in at the same time, the different numbers allow you to differentiate between one call and the other. In the example above, at a certain moment we have two outgoing calls from the NT interfaces to the mobile networks, one with reference 3 going to module GSM1 and the other, with reference number 4, going to module GSM0 as call back type Target. Then we have two incoming calls, also for the different GSM modules, with different reference figures.

Source - the source of the call, may be TE, NT, GSM0 or GSM1, or GSM-cbt or GSM-cbt which indicate a call-back operation, either with option Target or with Disa.

Destination - the destination of the respective call, the same possibilities as above. In addition, you can also have the destination "none", which is the dummy direction used for calls that you want to reject (prefixes that are forbidden, the respective calls go nowhere).

Identity - the ID of the caller, it can be an internal extension such as 105, 110, 120, or a mobile number for different networks, as shown above: 0740 ..., 0720 ..., 076 ... and so on.

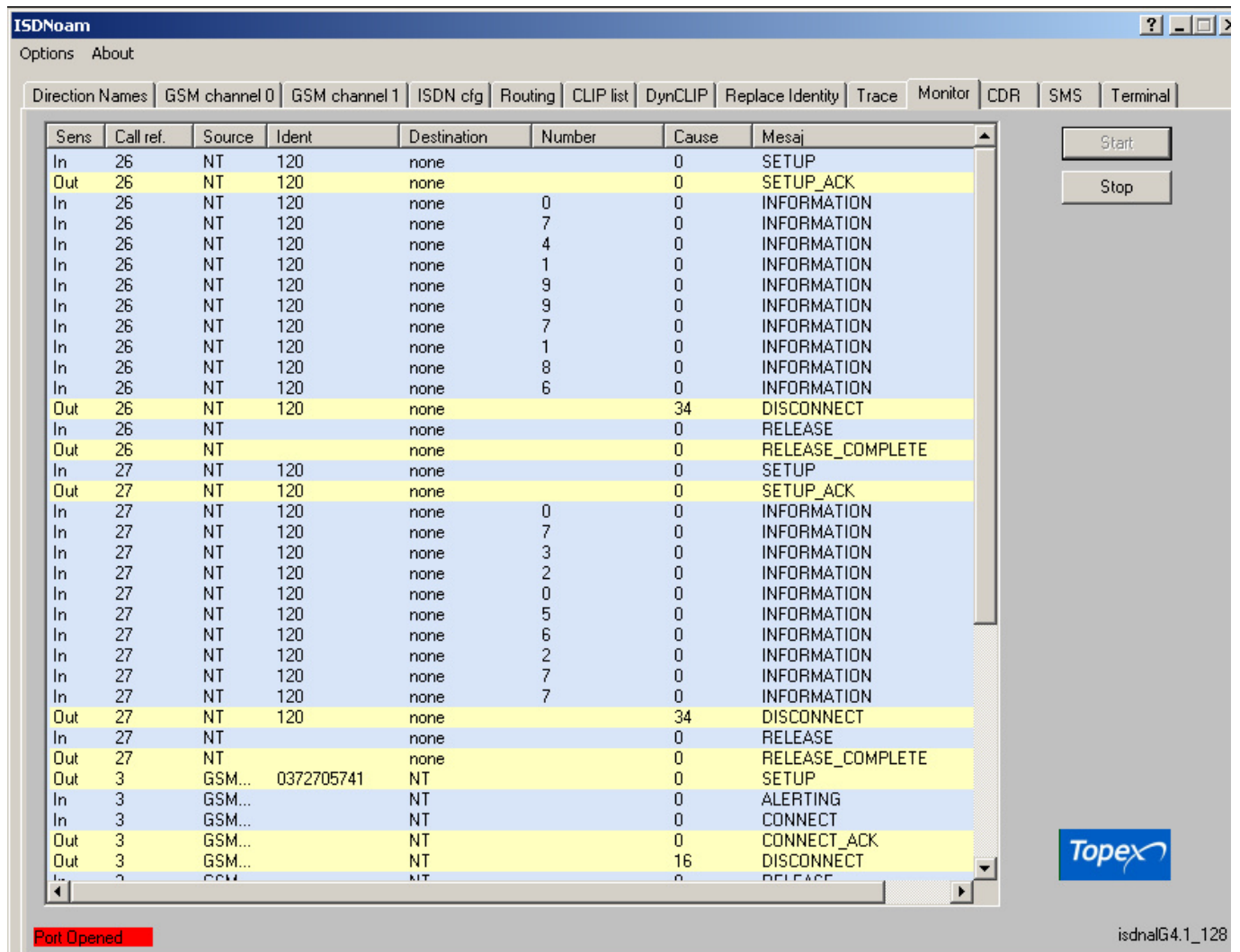
Number - the digits exchanged through the telephone interface. It may be either the destination of a local call, such as internal extension 120, or the successive digits used to dial an outgoing call to mobile network, such as 0 7 3 2 ...etc.

Cause - cause of the release of the call (zero, 16, 34 etc).

Mesaj - the Q931 message, indicates the current state of a call: setup, setup acknowledge, information (dialing the successive digits), alerting, connect, connect acknowledge, disconnect, proceed (voice call active), release, release complete, hold request, and so on.

Direction Names	GSM channel 0	GSM channel 1	ISDN cfg	Routing	CLIP list	DynCLIP	Replace Identity	Trace	Monitor	C
Sens	Call ref.	Source	Ident	Destination	Number	Cause	Mesaj			
In	4	NT	120	TE	9	0	INFORMATION			
In	4	NT	120	TE	9	0	INFORMATION			
In	4	NT	120	TE	7	0	INFORMATION			
In	4	NT	120	TE	1	0	INFORMATION			
In	4	NT	120	TE	8	0	INFORMATION			
In	4	NT	120	TE	6	0	INFORMATION			
In	4	NT	120	TE		0	DISCONNECT			
In	5	NT	120	none		0	SETUP			
Out	5	NT	120	none		16	RELEASE_COMPLETE			
Out	4	NT		TE		0	RELEASE_COMPLETE			
Out	4	NT	120	TE		102	RELEASE_COMPLETE			
In	6	NT	120	none		0	SETUP			
Out	6	NT	120	none		0	SETUP_ACK			
In	6	NT	120	none	0	0	INFORMATION			
In	6	NT	120	none	7	0	INFORMATION			
In	6	NT	120	none	3	0	INFORMATION			
In	6	NT	120	GSM1	2	0	INFORMATION			
In	6	NT	120	GSM1	0	0	INFORMATION			
In	6	NT	120	GSM1	5	0	INFORMATION			
Out	1	GSM...	0765455810	NT	120	0	SETUP			
In	6	NT	120	GSM1	6	0	INFORMATION			
In	1	GSM...		NT		0	ALERTING			
In	6	NT	120	GSM1	2	0	INFORMATION			
In	6	NT	120	GSM1	7	0	INFORMATION			
In	6	NT	120	GSM1	7	0	INFORMATION			
Out	6	NT	120	GSM1		0	CALL_PROCEEDING			
Out	6	NT	120	GSM1		0	ALERTING			
In	6	NT	120	GSM1		16	DISCONNECT			
Out	6	NT	120	GSM1		16	RELEASE			
In	6	NT		GSM1		0	RELEASE_COMPLETE			
In	1	GSM...		NT		0	CONNECT			
Out	1	GSM...		NT		0	CONNECT_ACK			
Out	1	GSM...		NT		16	DISCONNECT			
In	1	GSM...		NT		0	RELEASE			
Out	1	GSM...		NT		0	RELEASE_COMPLETE			

Remember that the monitoring option allows Live Monitoring of the calls, you must watch the screen in real time, no log files are created. You can see for example the sending out of the numbering, in order to find out if there are no problems with the PBX where TOPEX ISDN gateway is connected:

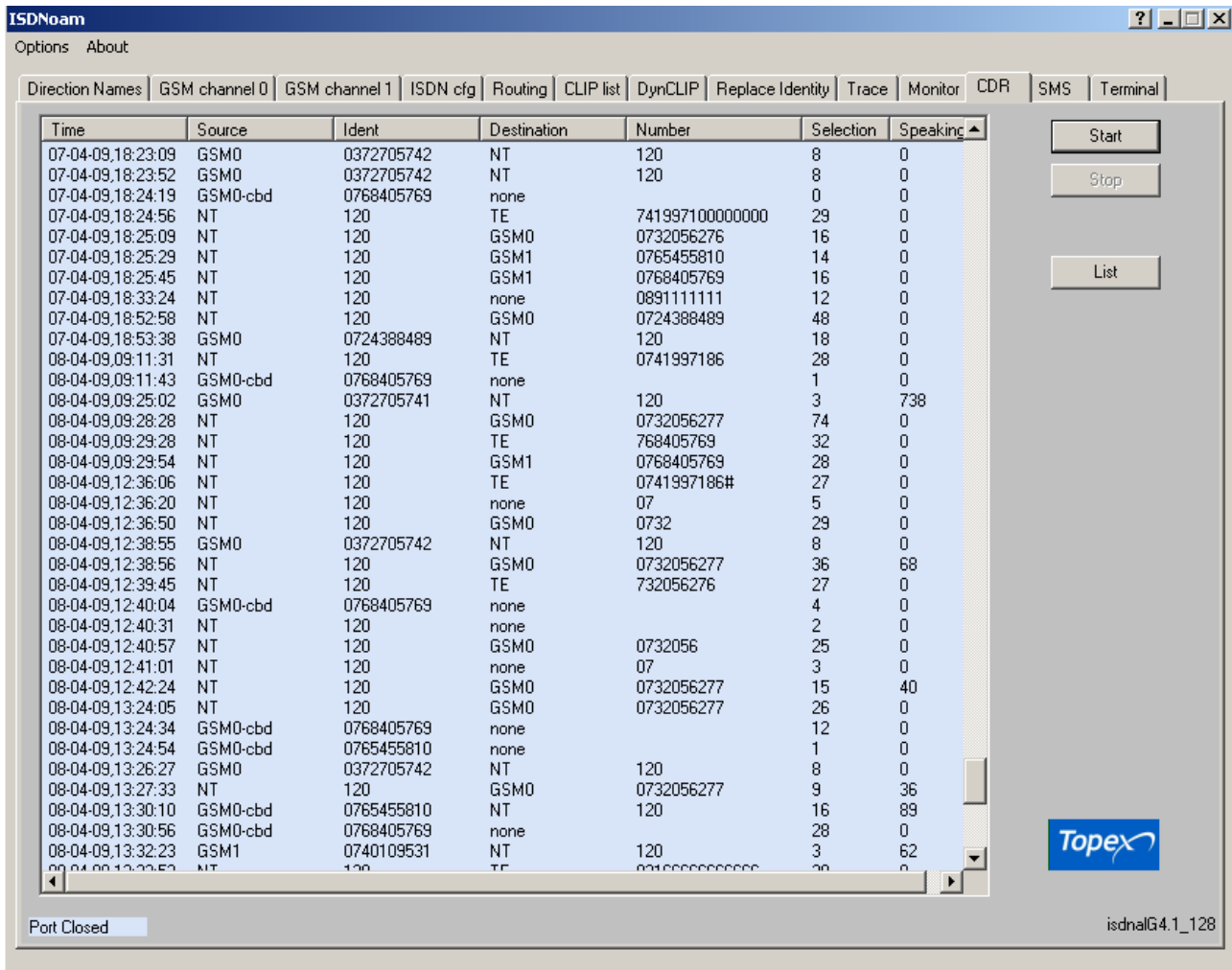


As long as Monitoring is active, the box in the bottom left corner shows "Port Opened". It will turn to a blue "Port Closed" indication when you press the Stop button.

8.10 CDR

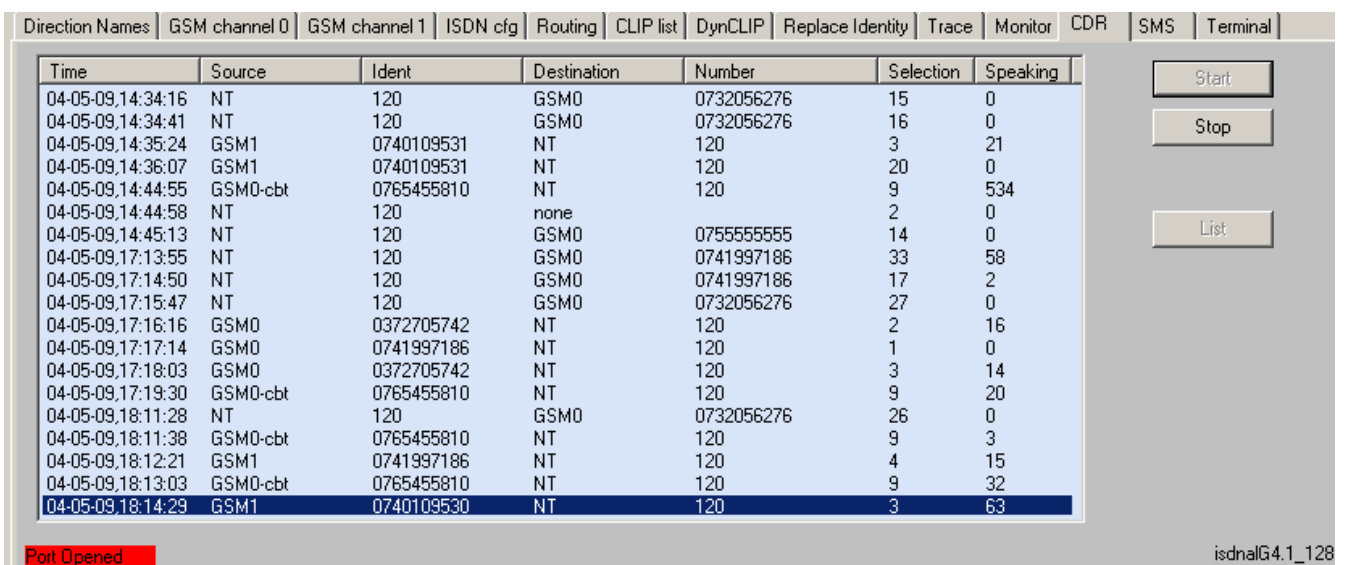
Use the tab "Call Detail Record" to view online the calls routed by the TOPEX box. Click the Start button, the list of ongoing calls will be shown, indexed by time.

While the Monitoring feature was intended for primary for debugging, CDR is intended mainly for the billing of the calls.



The billing file created by the OAM program is named tax.txt and include the information required for detailed billing (taxation) of the calls. The file is stored in the OUT sub-folder of the directory where you have placed the ISDNoam.exe application.

After you have pressed the Start button, the generating of call detail records begins, and the indication of the bottom of the OAM screen is „Port Opened“:



When you press Stop, the OAM program stops writing to the taxation file, and the indicator at the bottom of the screen becomes „Port Closed“:

Direction Names	GSM channel 0	GSM channel 1	ISDN cfg	Routing	CLIP list	DynCLIP	Replace Identity	Trace	Monitor	CDR	SMS	Term
Time	Source	Ident	Destination	Number	Selection	Speaking						
04-05-09,14:34:16	NT	120	GSM0	0732056276	15	0						
04-05-09,14:34:41	NT	120	GSM0	0732056276	16	0						
04-05-09,14:35:24	GSM1	0740109531	NT	120	3	21						
04-05-09,14:36:07	GSM1	0740109531	NT	120	20	0						
04-05-09,14:44:55	GSM0-cbt	0765455810	NT	120	9	534						
04-05-09,14:44:58	NT	120	none		2	0						
04-05-09,14:45:13	NT	120	GSM0	0755555555	14	0						
04-05-09,17:13:55	NT	120	GSM0	0741997186	33	58						
04-05-09,17:14:50	NT	120	GSM0	0741997186	17	2						
04-05-09,17:15:47	NT	120	GSM0	0732056276	27	0						
04-05-09,17:16:16	GSM0	0372705742	NT	120	2	16						
04-05-09,17:17:14	GSM0	0741997186	NT	120	1	0						
04-05-09,17:18:03	GSM0	0372705742	NT	120	3	14						
04-05-09,17:19:30	GSM0-cbt	0765455810	NT	120	9	20						
04-05-09,18:11:28	NT	120	GSM0	0732056276	26	0						
04-05-09,18:11:38	GSM0-cbt	0765455810	NT	120	9	3						
04-05-09,18:12:21	GSM1	0741997186	NT	120	4	15						
04-05-09,18:13:03	GSM0-cbt	0765455810	NT	120	9	32						
04-05-09,18:14:29	GSM1	0740109530	NT	120	3	63						

Port Closed

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Finally, the button List is used to display the whole of the taxation file, from the beginning up to the latest entry. The CDR file is stored on the PC, so it can be viewed even when the TOPEX ISDN gateway equipment is no longer connected!

Direction Names	GSM channel 0	GSM channel 1	ISDN cfg	Routing	CLIP list	DynCLIP	Replace Identity	Trace	Monitor	CDR	SMS	Terminal
Time	Source	Ident	Destination	Number	Selection	Speaking						
04-05-09,18:11:38	GSM0-cbt	0765455810	NT	120	9	3						
04-05-09,18:12:21	GSM1	0741997186	NT	120	4	15						
04-05-09,18:13:03	GSM0-cbt	0765455810	NT	120	9	32						
04-05-09,18:14:29	GSM1	0740109530	NT	120	3	63						
05-05-09,10:15:40	NT	120	GSM0	0732056277	17	0						
05-05-09,10:15:45	NT	120	none		0	0						
05-05-09,10:15:47	NT	120	none		0	0						
05-05-09,10:16:36	GSM1	0740109530	NT	120	7	23						
05-05-09,10:17:15	GSM0-cbt	0765455810	NT	120	9	29						
05-05-09,10:19:08	GSM1	0740109530	NT	120	15	110						
05-05-09,10:22:08	NT	120	GSM0	0732056277	12	7						
05-05-09,10:23:59	GSM0	0372705742	NT	120	45	0						
05-05-09,10:38:31	NT	120	GSM0	0732056277	22	10						
05-05-09,10:41:20	GSM0-cbt	0765455810	NT	120	3	0						
05-05-09,10:45:07	NT	120	GSM0	0732056277	14	70						
05-05-09,10:46:40	GSM0-cbt	0765455810	NT	120	10	54						
05-05-09,10:47:18	GSM1	0740109531	NT	120	6	13						
05-05-09,10:51:58	NT	120	GSM0	0732056277	14	4						
05-05-09,10:52:49	GSM0-cbt	0765455810	NT	120	9	0						
05-05-09,10:53:15	GSM1	0740109530	NT	120	5	12						
05-05-09,10:53:36	GSM0-cbt	0765455810	NT	120	12	0						
05-05-09,10:54:36	NT	120	TE	2130000000	17	0						
05-05-09,10:55:16	GSM0	0372705742	NT	120	1	0						
05-05-09,10:59:03	NT	120	GSM0	0732056277	16	0						
05-05-09,11:00:10	NT	120	GSM0	0732056277	11	7						
05-05-09,11:00:52	NT	120	GSM0	0732056277	10	14						
05-05-09,11:01:24	GSM1	0740109531	NT	120	5	9						
05-05-09,11:01:40	NT	120	GSM0	0732056277	10	5						
05-05-09,11:03:55	NT	120	GSM0	0732056277	9	2						
05-05-09,11:04:04	NT	120	none		5	0						
05-05-09,11:04:23	NT	120	GSM0	0210000000	15	0						
05-05-09,11:02:36	NT	120	none	0898989899	16	0						
05-05-09,11:02:52	NT	120	GSM0	0210000000	10	0						
05-05-09,11:03:07	NT	120	none	0898989898	14	0						
05-05-09,11:04:15	NT	120	GSM0	0732056277	13	43						

Port Closed

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Since the billing file may be very long, to the right you have a scroll bar, with it you can go up and down in the file.

Remember that for each call, the number and the identity *can be subject to modifications* by the Topex ISDN boxy. The changes are caused by applying the rules about the ignore and insert operations and the maximum expected digits. In addition, replace identity may change the ID of calls. But in the billing files the phone number and the identity will always be the original (initial) ones, to allow a proper charging of the callers!

Description of the fields in the CDR file:

Time - Day and Time of the call in the following format dd-mm-yy, hh:mm:ss (ending time). For instance, the date 05-05-09 means the fifth of May 2009, and 10:59:03 is ten hours (AM), 59 minutes and 03 seconds. The time is always the moment of ending of the call, this is why a call does show up in the CDR list only after it has ended.

Source - the source of the call, it can be the TE or NT interfaces of ISDN, the GSM module 0 or 1, or the GSM modules in call-back operation, either with the option Target, or with Disa.

Ident - number of the local Subscriber (internal extensions such as 105, 120) or caller identity (telephone numbers for fixed or mobile networks, up to 20 digits long)

Destination - destination of the call; it can be one of the interfaces of ISDN, TE or NT, the mobile modules GSM0 or GSM1, or also „none“, the dummy direction used for calls that you want to reject.

Number - call number (up to 20 digits)

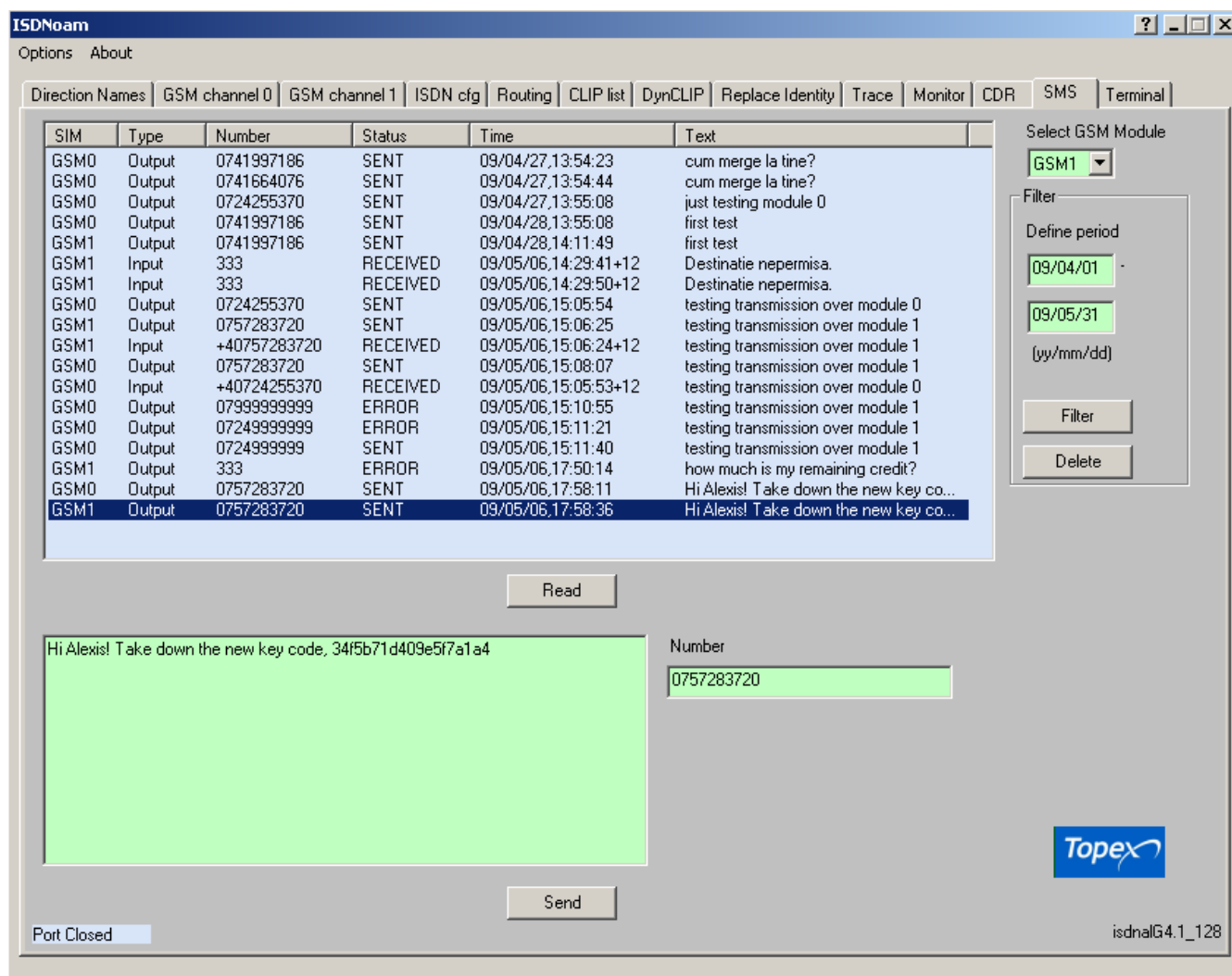
Selection - three digits, the total time (in seconds), cumulated value of both dial time and selection time

Speaking - duration of the call in seconds (up to 6 digits)

Time	Source	Ident	Destination	Number	Selection	Speaking
08-04-09,09:11:43	GSM0-cbd	0768405769	none		1	0
08-04-09,09:25:02	GSM0	0372705741	NT	120	3	738
08-04-09,09:28:28	NT	120	GSM0	0732056277	74	0
08-04-09,09:29:28	NT	120	TE	768405769	32	0
08-04-09,09:29:54	NT	120	GSM1	0768405769	28	0
08-04-09,12:36:06	NT	120	TE	0741997186#	27	0
08-04-09,12:36:20	NT	120	none	07	5	0
08-04-09,12:36:50	NT	120	GSM0	0732	29	0
08-04-09,12:38:55	GSM0	0372705742	NT	120	8	0
08-04-09,12:38:56	NT	120	GSM0	0732056277	36	68
08-04-09,12:39:45	NT	120	TE	732056276	27	0
08-04-09,12:40:04	GSM0-cbd	0768405769	none		4	0
08-04-09,12:40:31	NT	120	none		2	0
08-04-09,12:40:57	NT	120	GSM0	0732056	25	0
08-04-09,12:41:01	NT	120	none	07	3	0
08-04-09,12:42:24	NT	120	GSM0	0732056277	15	40
08-04-09,13:24:05	NT	120	GSM0	0732056277	26	0
08-04-09,13:24:34	GSM0-cbd	0768405769	none		12	0
08-04-09,13:24:54	GSM0-cbd	0765455810	none		1	0
08-04-09,13:26:27	GSM0	0372705742	NT	120	8	0
08-04-09,13:27:33	NT	120	GSM0	0732056277	9	36
08-04-09,13:30:10	GSM0-cbd	0765455810	NT	120	16	89
08-04-09,13:30:56	GSM0-cbd	0768405769	none		28	0
08-04-09,13:32:23	GSM1	0740109531	NT	120	3	62
08-04-09,13:32:52	NT	120	TE	0216666666666666	28	0
08-04-09,13:33:23	NT	120	TE	07499999999	29	0
08-04-09,13:33:47	NT	120	GSM0	0732056276	24	0
08-04-09,13:34:14	GSM0-cbd	0768405769	none		2	0
08-04-09,13:34:37	GSM0-cbd	0765455810	none		0	0
08-04-09,13:34:37	GSM1	0740109531	NT	120	6	8
08-04-09,13:36:04	GSM0-cbt	0765455810	NT	3	13	0
08-04-09,13:36:24	GSM1	0740109531	NT	120	5	4
08-04-09,13:50:23	NT	120	GSM0	0732056277	14	0
08-04-09,13:51:09	GSM0-cbt	0765455810	NT	120	8	0
08-04-09,14:23:38	NT	120	GSM0	0732056277	10	8
08-04-09,14:23:39	GSM0-cbt	0765455810	NT	120	7	0
08-04-09,14:24:06	GSM0-cbd	0768405769	none		10	0

8.11 SMS options

SMS messages can also be sent out and received by the TOPEX ISDN box, using the tab “SMS”.



The file card “SMS”, which shows up, has several panes:

- on top, over light blue background, a list of the SMS messages sent or received. The columns of the list show the SIM (GSM module) used, the destination or source phone number, the state of the message, the date and time, and the full text of the message,
- below it, over light green background, a window for composing SMS messages. Here you can either type the message from the keyboard of the computer, or you paste the text that you have copied from another application (text processor, e-mail client, spreadsheet, data base, etc). To the right you enter the mobile phone number that is the destination of the SMS, then press the button “Send” located at the bottom.
- on top right you can find the control pane. From here, you must first select which of the GSM modules will be used to send out the SMS messages – choose either GSM0 or GSM1.

This pane is also for managing the list of received messages - you can filter them out or delete them. In the two fields of the "Define Period" window, enter the dates for beginning and respective ending, then click the button **Filter** to see only the SMS from the respective period, or **Delete** if you want to erase them:

Filtering, with different time periods - select period from March to April:

SIM	Type	Number	Status	Time	Text	
GSM0	Output	0741997186	SENT	09/04/27,13:54:23	cum merge la tine?	
GSM0	Output	0741664076	SENT	09/04/27,13:54:44	cum merge la tine?	
GSM0	Output	0724255370	SENT	09/04/27,13:55:08	just testing module 0	
GSM0	Output	0741997186	SENT	09/04/28,13:55:08	first test	
GSM1	Output	0741997186	SENT	09/04/28,14:11:49	first test	

Select GSM
 GSM1
 Filter
 Define period
 09/03/25
 09/04/29

Select the beginning of May:

SIM	Type	Number	Status	Time	Text
GSM1	Input	333	RECEIVED	09/05/06,14:29:50+12	Destinatie nepermisa.
GSM0	Output	0724255370	SENT	09/05/06,15:05:54	testing transmission over module 0
GSM1	Output	0757283720	SENT	09/05/06,15:06:25	testing transmission over module 1
GSM1	Input	+40757283720	RECEIVED	09/05/06,15:06:24+12	testing transmission over module 1
GSM0	Output	0757283720	SENT	09/05/06,15:08:07	testing transmission over module 1
GSM0	Input	+40724255370	RECEIVED	09/05/06,15:05:53+12	testing transmission over module 0
GSM0	Output	07999999999	ERROR	09/05/06,15:10:55	testing transmission over module 1
GSM0	Output	07249999999	ERROR	09/05/06,15:11:21	testing transmission over module 1
GSM0	Output	07249999999	SENT	09/05/06,15:11:40	testing transmission over module 1
GSM1	Output	333	ERROR	09/05/06,17:50:14	how much is my remaining credit?
GSM0	Output	0757283720	SENT	09/05/06,17:58:11	Hi Alexis! Take down the new key co...
GSM1	Output	0757283720	SENT	09/05/06,17:58:36	Hi Alexis! Take down the new key co...
GSM0	Output	0741997186	SENT	09/05/07,11:44:35	Hi Doug, the meeting was postponed,...
GSM0	Output	0757283720	SENT	09/05/07,11:45:22	another test for the swine flu
GSM1	Output	0757283720	SENT	09/05/07,11:45:33	another test for the swine flu
GSM1	Output	0741664076	SENT	09/05/07,11:46:05	ai ajuns la servici? cum merge? Spor!
GSM0	Output	0741664076	SENT	09/05/07,11:46:17	ai ajuns la servici? cum merge? Spor!
GSM0	Output	0724255370	SENT	09/05/07,11:47:27	next TGE key is 8f6e4b32a02d5602d...

Finally, you can press **Delete** to erase the messages inside the time interval you have established. The SMS list is now cleared!:

Delete

Delete SMS records based on defined period.

Direction Names	GSM channel 0	GSM channel 1	ISDN cfg	Routing	CLIP list	DynCLIP	Replace Identity	Trace	Monitor	CDR	SMS	Te
SIM	Type	Number	Status	Time	Text							

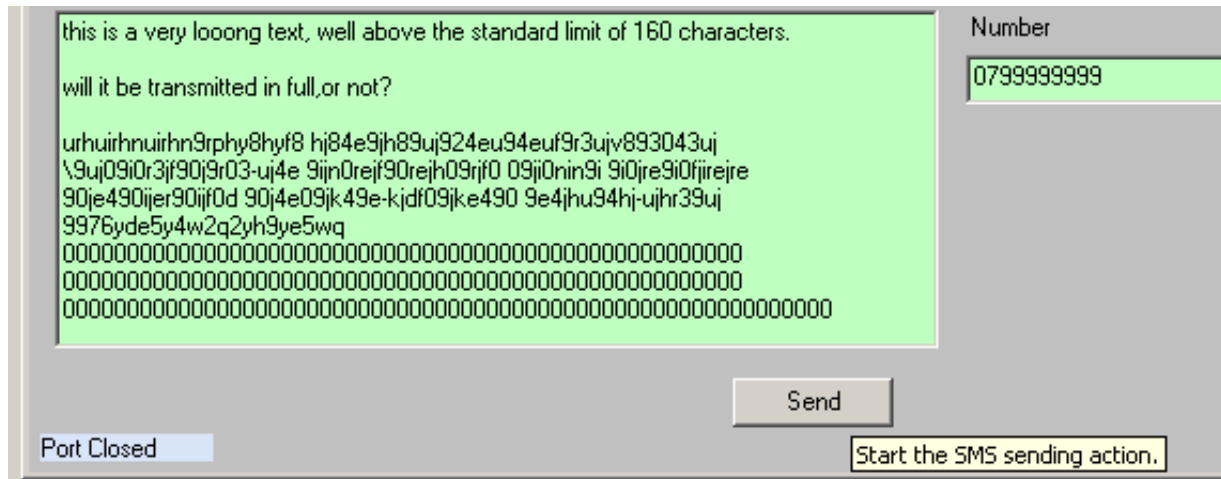
Select GSM
 GSM0
 Filter
 Define period

Notes:

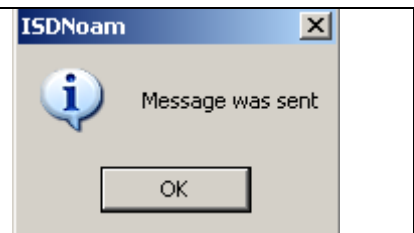
- according to their specifications, SMS messages have a maximum length of 160 characters
- the SMSC phone number, that is the "SMS Service Centre Number", does not need to be entered in the OAM program, it will be read by TOPEX ISDN gateway from each SIM card

8.11.1 Send SMS

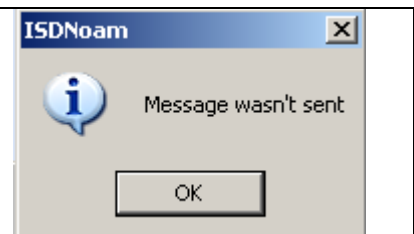
When you want to transmit a SMS message that you have written or copied in the green **Message Tex** box, verify you have selected the module you want, for example GSM1, enter the number of the destination in the **"Number"** box and then press the **"Send"** button:



The "Port Closed" indication turn to a red "Port Opened", showing that TOPEX ISDN gateway transmits the message. When the message has been successfully sent, you should see a confirmation message like this:



In case of error, for example if you have entered an incorrect phone number for the recipient, you will see a warning that the message could not be transmitted:



8.11.2 Receive SMS

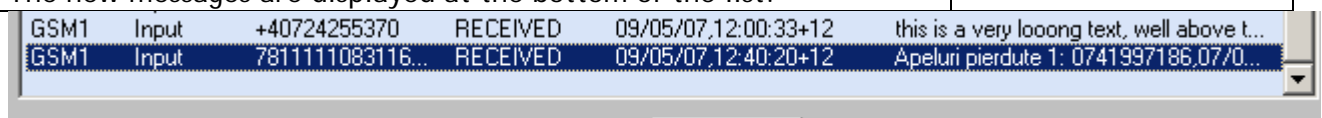
To read the received SMS messages, first select the GSM module 0 or 1 and then click on the **"Read"** button.



This may take some time, since the program looks for new SMS messages that previously have been stored either in the memory of the GSM module or on the SIM card for the respective module, calls them up to be shown in the "SMS" list, and deletes them in the initial location. If there are new messages, you will see a note telling that "SMS were read!"



The new messages are displayed at the bottom of the list:



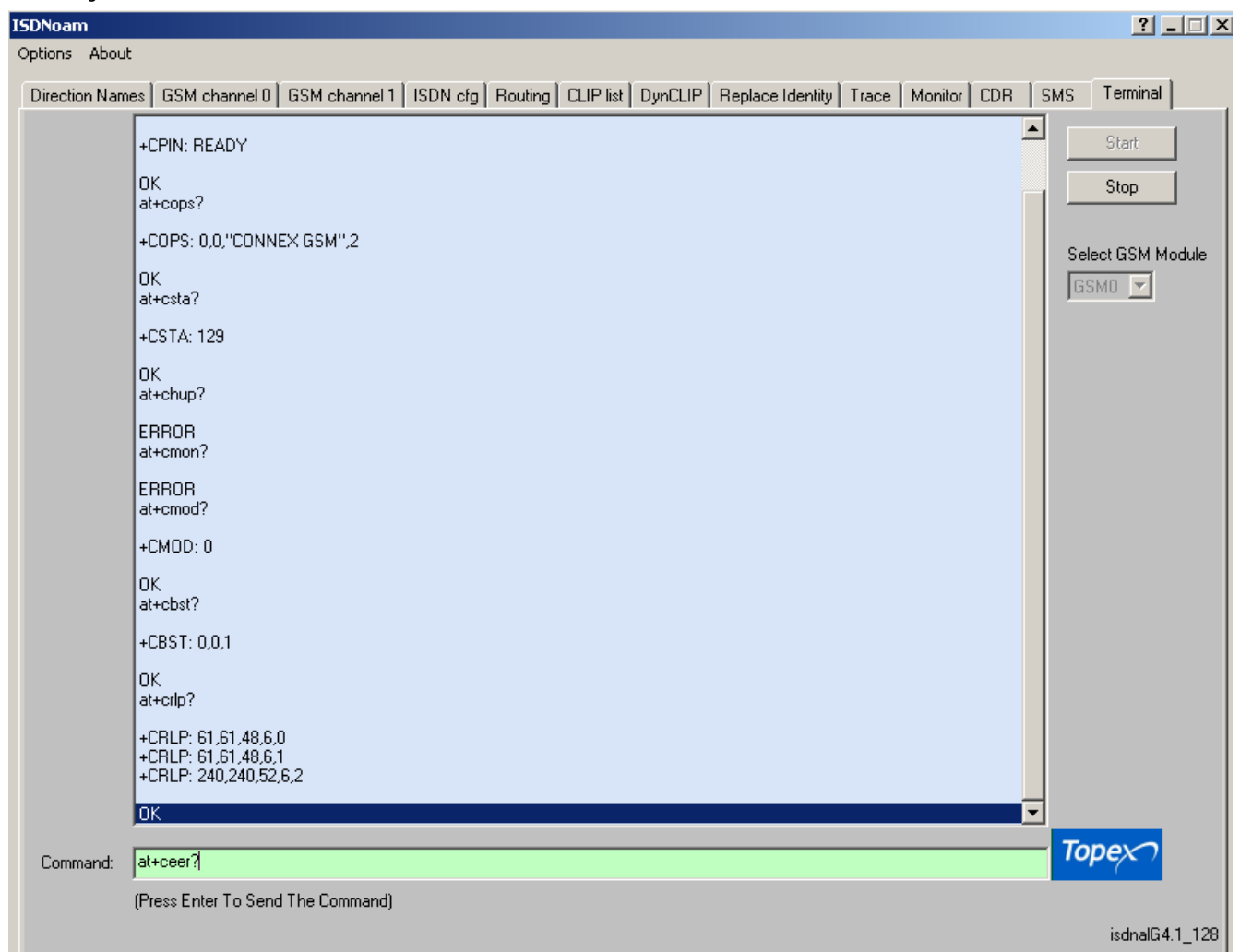
If, since the previous click on the “Read” button, no other SMS have been received, the program will see that there are no new messages, and will tell you about this:



Note: the OAM program deletes the received messages, after reading and displaying them in the list on your screen. The erasing of old messages is necessary, because the storage memory available, either in the GSM module or on the SIM card, is limited. If the previous messages are not deleted, the respective memory may fill up, and the module could become “blocked” for a new incoming message – it will be unable to receive another SMS!

8.12 Terminal

The last file card of the OAM program is “Terminal”. With it you can send AT-commands directly to GSM modules and watch their answers.



First you must select the GSM module you want to interrogate, such as GSM0 in the above example. Then click the button Start to begin the session, the module must respond with an "OK".

Enter the commands in the green box labeled **Command** located at the bottom. In the blue central field of the screen you see the initial command, then the answer from the module and finally either "OK" to confirm successful interrogation or "ERROR" when you typed something wrong or the command is not supported on the respective GSM module or subscriber card!

For example, the **AT+cops?** command makes the GSM module show the operator where it is registered. In this image you can see the response of the two GSM modems of TOPEX ISDN gateway to the AT+cops? Interrogation:

```
OK
at+cops?
+COPS: 0,0,"RO ORANGE",2
OK
OK
at+cops?
+COPS: 0,0,"CONNEX GSM",2
OK
```

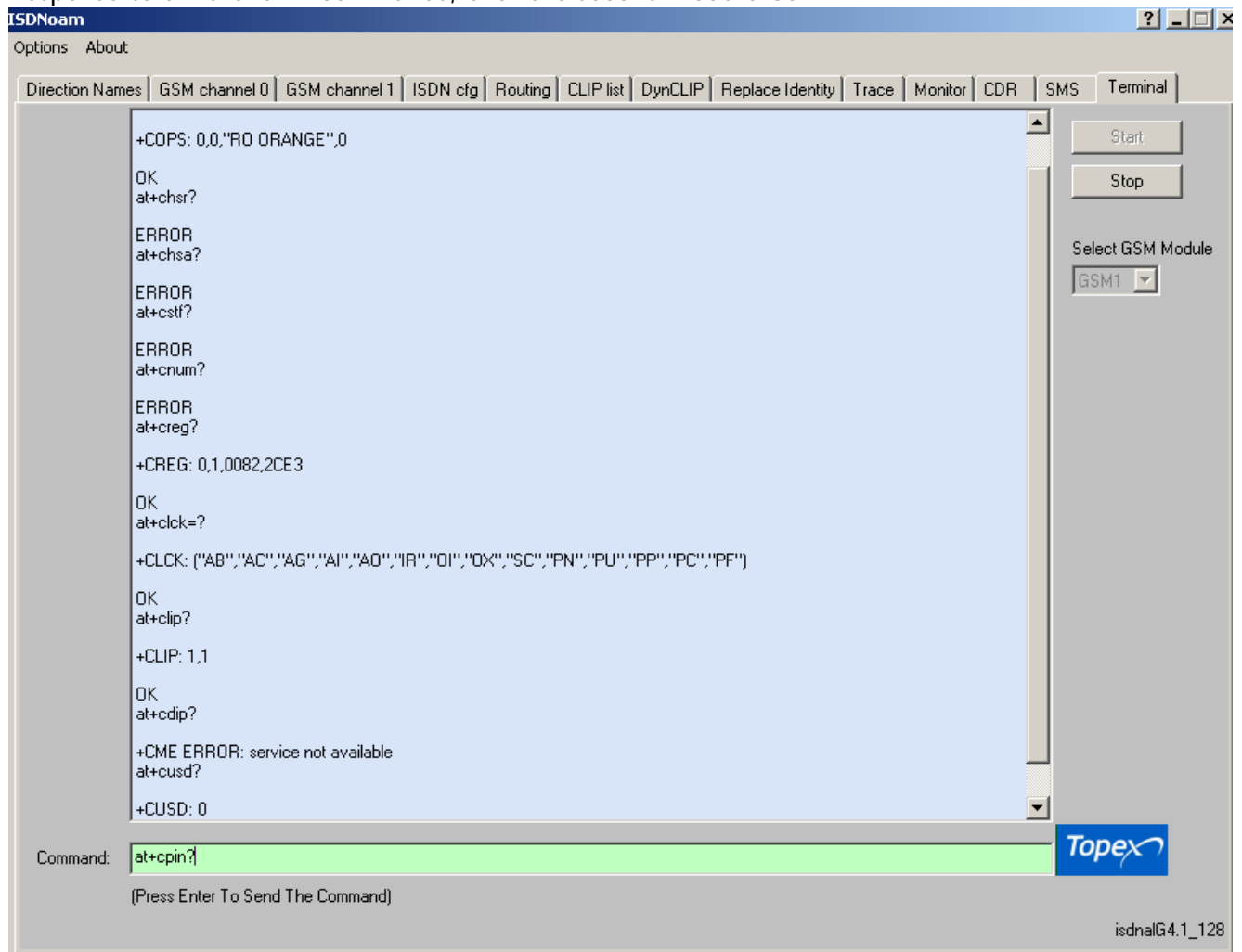
Next, the **ATI** command makes the module show all hardware and firmware related information: manufacturer, model, revision, IMEI, GSM or 3G capabilities, and so on. As you can see, the two modules are identical (from the same production batch), except for the IMEI code which is unique for every mobile device in the world.

```
OK
aTI
Manufacturer: Sierra Wireless, Inc.
Model: MC8775V
Revision: H1_1_8_3MCAP C:/WS/FW/H1_1_8_3MCAP/MSM6280/SRC 2007/03/08 18:17:59
IMEI: 352679013336230
IMEI SV: 6
FSN: D301568214610
3GPP Release 5
+GCAP: +CGSM,+DS,+ES

OK

OK
ATI
Manufacturer: Sierra Wireless, Inc.
Model: MC8775V
Revision: H1_1_8_3MCAP C:/WS/FW/H1_1_8_3MCAP/MSM6280/SRC 2007/03/08 18:17:59
IMEI: 352679013333781
IMEI SV: 6
FSN: D301368175910
3GPP Release 5
+GCAP: +CGSM,+DS,+ES
```

Response to different AT commands, over the second module GSM1:



9 FILES

General description

The ISDNNoam program uses several types of files, for different purposes: for CDR, for saving current configuration (your settings), for its internal configuration, system software image files (application software to be sent to a TOPEX ISDN GATEWAY unit), etc.

When you install the application, or when you run it for the first time, it creates three sub-folders in the respective root directory. These are called CONFIG, OUT and SAVED.

Name	Size	Type	Date Modified
CONFIG		File Folder	16.04.2009 12:48
OUT		File Folder	14.04.2009 17:11
SAVED		File Folder	13.04.2009 11:13
analyzerLOG	16 KB	File	06.04.2009 17:28
apel-test	3 KB	File	08.04.2009 12:39
full-log	62 KB	File	25.03.2009 15:19
isdh.log	7 KB	Text Document	15.04.2009 10:02
logtrace3	3 KB	File	01.04.2009 11:22
mainrect.dat	1 KB	Video CD Movie	16.04.2009 12:52
TopexISDNNoam.exe	540 KB	Application	01.04.2009 17:43
trace-ambebe	8 KB	File	02.04.2009 17:41
xemnira	50 KB	File	19.03.2009 18:10

9.1 Folder CONFIG

The CONFIG subfolder stores the files holding the internal configuration for TOPEX ISDN gateway.

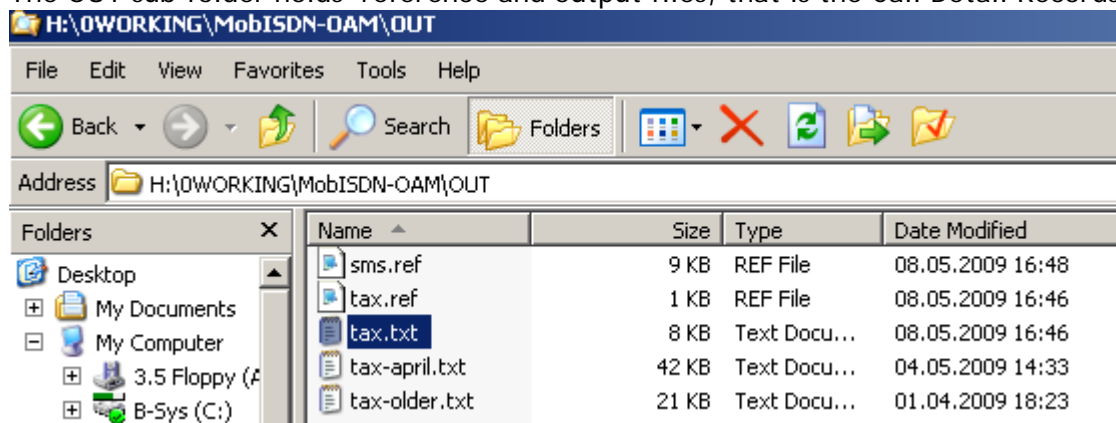
Name	Size	Type	Date Modified
australia.cfg	1 KB	CFG File	16.04.2009 12:14
operator.cfg	1 KB	CFG File	16.04.2009 12:14
settings.cfg	1 KB	CFG File	05.05.2009 11:16
south-africa.cfg	1 KB	CFG File	13.04.2009 11:42
spania.cfg	1 KB	CFG File	13.04.2009 11:42

The “settings.cfg” file contains internal settings for the Topex box. The “operator.cfg” file contains information about the local mobile operators (network carriers) so it is country-specific. You must edit this file in order to correctly show the providers who are active in your country or area. In the example above, the file with the default name “operator” holds the codes for the Romanian operator, but there are also files for the operators in Australia, South Africa and Spain. So, if you plan to use the TOPEX ISDN gateway in Australia, you should rename the file “australia.cfg” to “operator.cfg”, which is the name that the OAM program will look for!

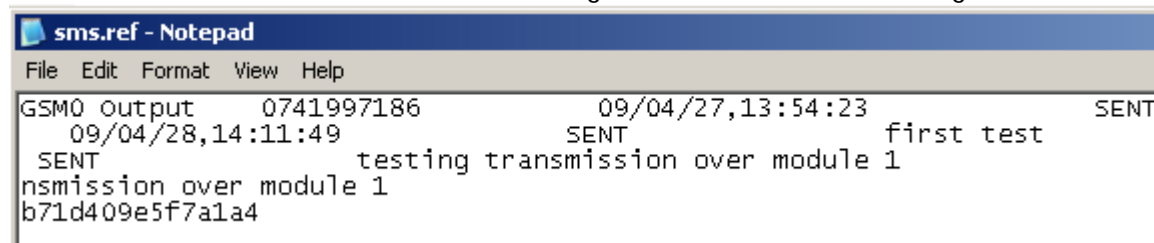
The configuration of a TOPEX ISDN GATEWAY system can be downloaded and saved in a file named by the user. The file will have extension "cfg" and will be located in the "CONFIG" directory, in the same place where the program "isdncfg.exe" is located. After you save the configuration of one TOPEX ISDN GATEWAY system you can load it into several other Topex systems.

9.2 Folder OUT

The OUT sub-folder holds reference and output files, that is the Call Detail Records.

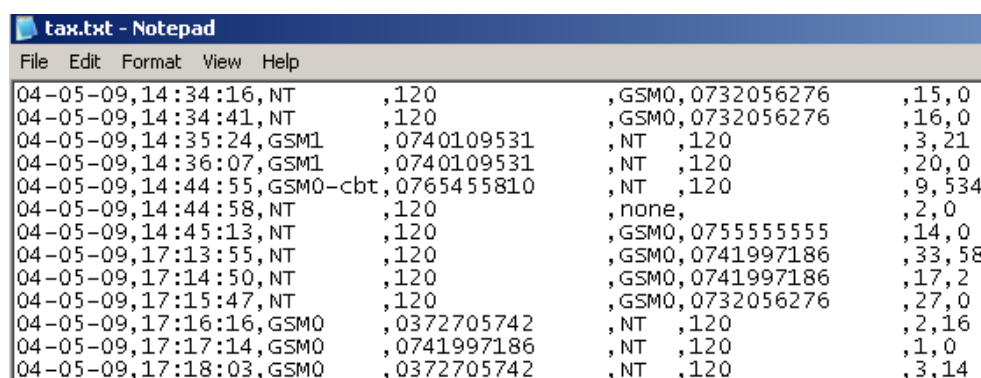


Sms.ref is the file that holds the SMS messages sent and received through TOPEX ISDN gateway:



Tax.ref is the internal time reference for the billing file. You cannot edit this file.

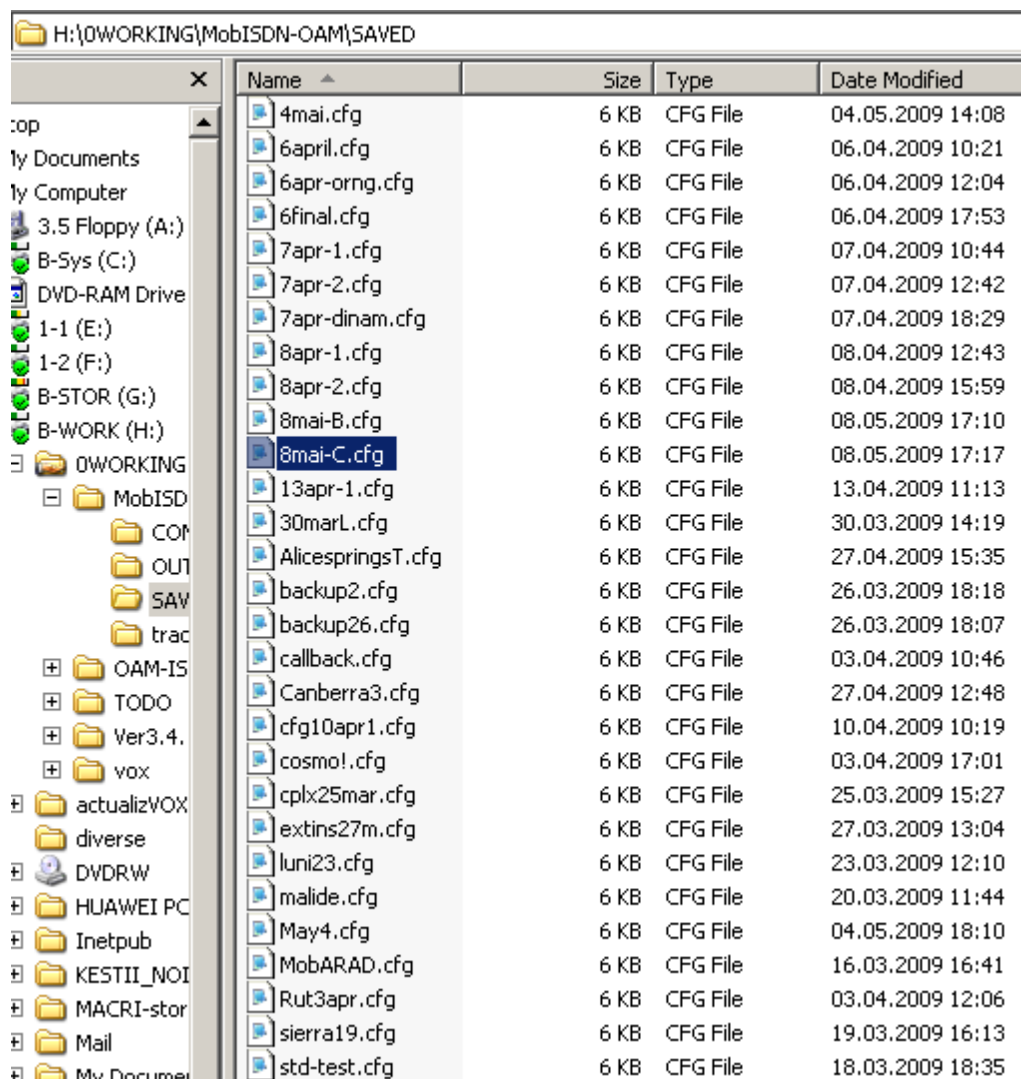
Tax.txt is the current billing file of the OAM program:



You may copy and rename this file, for backup purposes. For example, if you have a lot of traffic, the billing file can become very large, so you rename the previous files according to the time periods: "tax-1-15march", "tax16-31March", "tax-April", and so on. Tax.txt will always be the current billing file.

9.3 Folder SAVED

In this subfolder, the OAM program stores the saved configuration files.



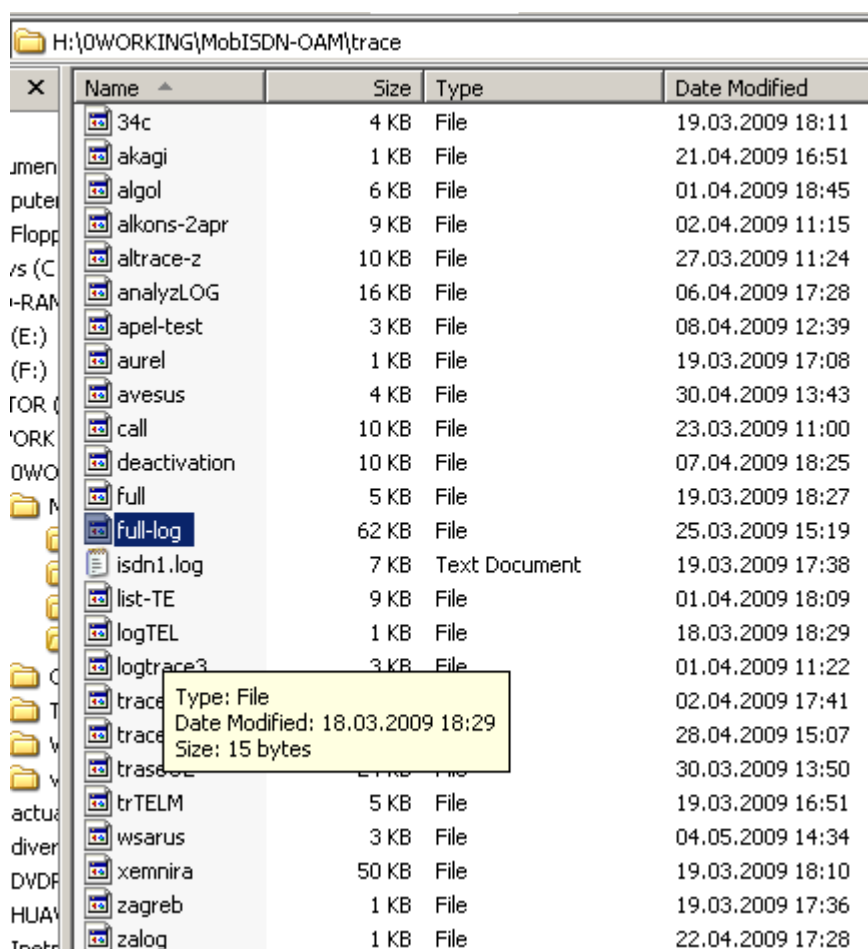
Name	Size	Type	Date Modified
4mai.cfg	6 KB	CFG File	04.05.2009 14:08
6april.cfg	6 KB	CFG File	06.04.2009 10:21
6apr-orng.cfg	6 KB	CFG File	06.04.2009 12:04
6final.cfg	6 KB	CFG File	06.04.2009 17:53
7apr-1.cfg	6 KB	CFG File	07.04.2009 10:44
7apr-2.cfg	6 KB	CFG File	07.04.2009 12:42
7apr-dinam.cfg	6 KB	CFG File	07.04.2009 18:29
8apr-1.cfg	6 KB	CFG File	08.04.2009 12:43
8apr-2.cfg	6 KB	CFG File	08.04.2009 15:59
8mai-B.cfg	6 KB	CFG File	08.05.2009 17:10
8mai-C.cfg	6 KB	CFG File	08.05.2009 17:17
13apr-1.cfg	6 KB	CFG File	13.04.2009 11:13
30marL.cfg	6 KB	CFG File	30.03.2009 14:19
AlicespringsT.cfg	6 KB	CFG File	27.04.2009 15:35
backup2.cfg	6 KB	CFG File	26.03.2009 18:18
backup26.cfg	6 KB	CFG File	26.03.2009 18:07
callback.cfg	6 KB	CFG File	03.04.2009 10:46
Canberra3.cfg	6 KB	CFG File	27.04.2009 12:48
cfg10apr1.cfg	6 KB	CFG File	10.04.2009 10:19
cosmo!.cfg	6 KB	CFG File	03.04.2009 17:01
cplx25mar.cfg	6 KB	CFG File	25.03.2009 15:27
extins27m.cfg	6 KB	CFG File	27.03.2009 13:04
luni23.cfg	6 KB	CFG File	23.03.2009 12:10
malide.cfg	6 KB	CFG File	20.03.2009 11:44
May4.cfg	6 KB	CFG File	04.05.2009 18:10
MobARAD.cfg	6 KB	CFG File	16.03.2009 16:41
Rut3apr.cfg	6 KB	CFG File	03.04.2009 12:06
sierra19.cfg	6 KB	CFG File	19.03.2009 16:13
std-test.cfg	6 KB	CFG File	18.03.2009 18:35

These configuration files contain all your settings (parameters for the equipment) that you have saved previously - direction names, directions allocation, overflow, settings of the GSM modules, settings for TE and NT interfaces, routing table, static and dynamic CLIP table, SMS information, etc.

9.4 Other subfolders

You may create additional sub-folders, suited to your specific needs. For instance, you may have sub-folders inside SAVED, storing settings particular for different locations of types of PBX equipment that TOPEX ISDN gateway is use with. In the example below, you can see a "Trace" subfolder, created to house a large number of tracing files, which normally are stored in the root folder of the "ISDNoam" application.

This can be useful if you use a lot the Trace option of the tabbed menu, and you don't want to clutter too much the root folder were the ISDNoam.exe application is located:

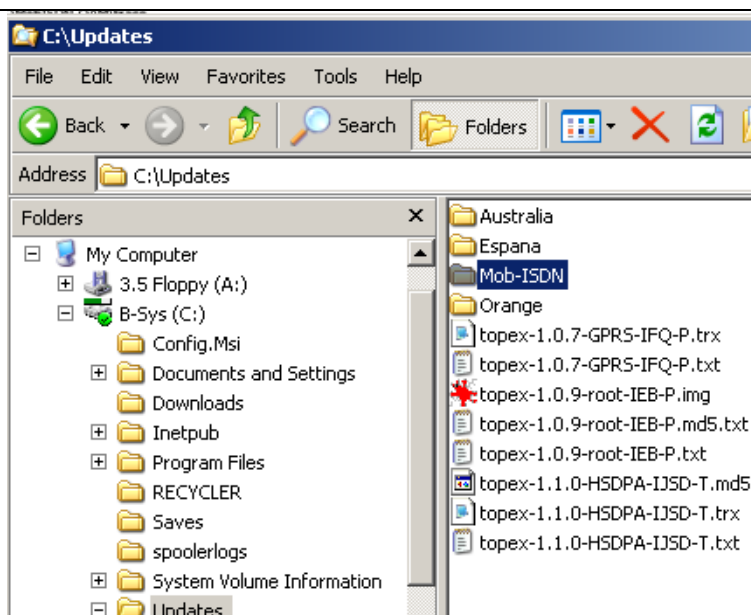


Name	Size	Type	Date Modified
34c	4 KB	File	19.03.2009 18:11
akagi	1 KB	File	21.04.2009 16:51
algol	6 KB	File	01.04.2009 18:45
alkons-2apr	9 KB	File	02.04.2009 11:15
altrace-z	10 KB	File	27.03.2009 11:24
analyzLOG	16 KB	File	06.04.2009 17:28
apel-test	3 KB	File	08.04.2009 12:39
aurel	1 KB	File	19.03.2009 17:08
avesus	4 KB	File	30.04.2009 13:43
call	10 KB	File	23.03.2009 11:00
deactivation	10 KB	File	07.04.2009 18:25
full	5 KB	File	19.03.2009 18:27
full-log	62 KB	File	25.03.2009 15:19
isdn1.log	7 KB	Text Document	19.03.2009 17:38
list-TE	9 KB	File	01.04.2009 18:09
logTEL	1 KB	File	18.03.2009 18:29
logtrace3	3 KB	File	01.04.2009 11:22
trace			02.04.2009 17:41
trace			28.04.2009 15:07
trace			30.03.2009 13:50
trTELM	5 KB	File	19.03.2009 16:51
wsarus	3 KB	File	04.05.2009 14:34
xemnira	50 KB	File	19.03.2009 18:10
zagreb	1 KB	File	19.03.2009 17:36
zalog	1 KB	File	22.04.2009 17:28

9.5 Image Files

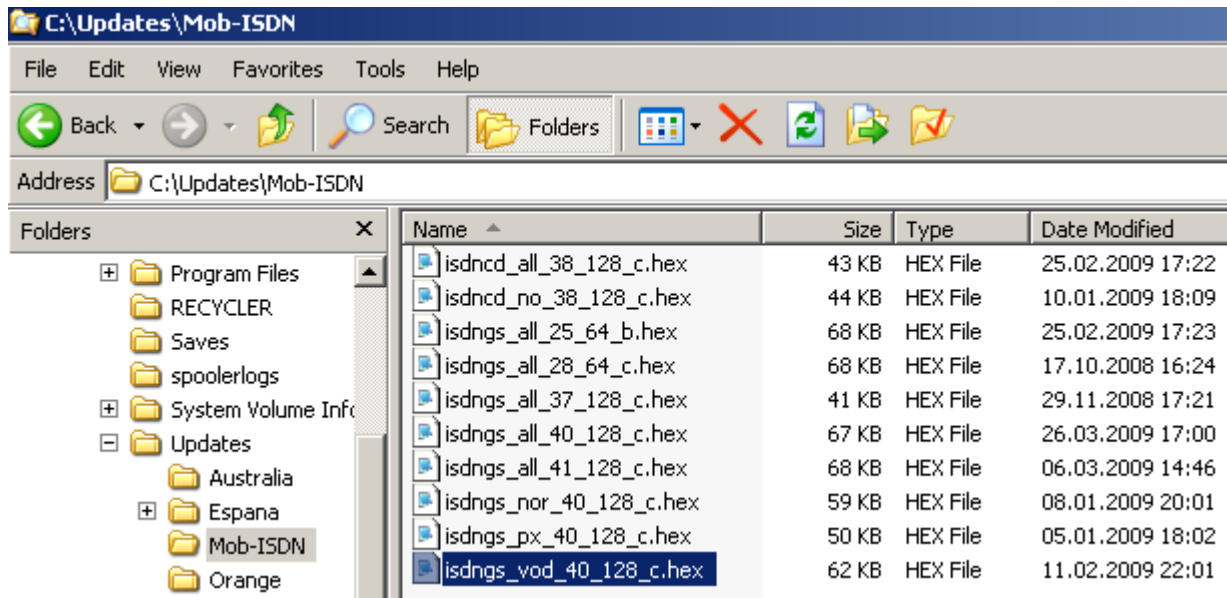
These files are used to perform firmware update for the Topex box.

In this example, all the firmware image files for different Topex equipments are stored in a folder called Updates on the C: (system) hard disk drive of the PC. Specifically, the files intended for TOPEX ISDN gateway-2-GSM are stored in the sub-folder named "Mob-ISDN":



The **software image** file has "hex" extension. It is a downloadable image of the software application that runs on the TOPEX ISDN GATEWAY equipment.
Such kind of file can be located anywhere on the Hard Disk.
The user will open the file from a dialog window and the software image will be send into the respective TOPEX ISDN GATEWAY system.

In the example below, the name of the selected image file suggest the equipment (ISDN-GSM), the purpose (for Vodafone carrier), the version (40) and the model of the TOPEX ISDN gateway for which it is intended (128):



10 GLOSSARY

Here you have the explanation of some terms and acronyms used in the user manual for the TOPEX ISDN gateway-2-GSM system.

ANI - Acronym for **Automated Number Identification**; A number (typically telephone number) that is sent along the phone line at the beginning of a call. It identifies the calling party to the receiving party. Named also Caller ID. This is used by the OAM program for automated routing of incoming calls according to their ID.

AOC - Acronym for "Advice of Charge", signaling protocol used to send charging (billing) information to the phone exchange where TOPEX ISDN GATEWAY is connected. It is a performance characteristic of the EDSS1, which shows the connection charges as tariff units during and at the end of a voice link that has been made. Performed by means of billing pulses. AOC is the charge for the call, computed by the mobile phone according to the network provider's tariff and expressed in terms of Home Units. TOPEX ISDN gateway has two adjustable settings for computing the charge pulses that are sent at the beginning of the call and during the call. You can select the number of initial pulses and the time delay between two billing pulses.

Bootloader - bootstrap loader, small program that launches first upon power up and helps loading the operating system. Any computer system can execute only code that is stored in DRAM memory, but the operating system is stored on hard disk drives or Flash memory. In the case of TOPEX ISDN gateway, the bootloader starts first when you power up the equipment and allows loading of the main application that controls the ISDN to GSM interface.

CLIP - Acronym for **Calling Line Identity Presentation**. For end-users, this service is handy in order to screen incoming calls, prepare the specific response, greeting the caller by name or looking up for missed or unanswered phone calls. The TOPEX ISDN gateway ISDN2GSM unit makes use of the CLIP facility to identify the subscribers who called and route the calls according to their Caller ID. The ID is also used for the call-back feature.

DID - Acronym for **Direct Inward Dialing**. Allows a party calling from outside into a PABX to be connected directly to a local extension, without need for assistance from the operator. This way, incoming calls can get directly to the local subscriber they need.

DISA - Acronym for **Direct Inward System Access**. This function allows an outside caller to directly access a local subscriber of the phone exchange by using DTMF codes. TOPEX ISDN gateway may use DISA to route the incoming calls.

DTMF - Acronym for **Dual Tone Multi Frequency**, also known as "touch tone". Advanced method for dialing a number, instead of the older Pulse mode. When you press a key on the keypad a combination of two audio frequencies is sent on the line.

EDSS1 - Acronym for **European D-channel Signaling System No 1**, the full name of the Euro-ISDN protocol. It is a new data link protocol that was introduced with the transition of national ISDNs to the whole of Europe. EDSS1 is supported by all the states of the Union and contains the mandatory performance characteristics that control the establishment and clearance of a link, as well as providing several supplements. In addition to these general requirements, different national network carriers may extend its performance characteristics.

IMEI - Acronym for **International Mobile Equipment Identifier**. 15-digit number that uniquely identifies an individual mobile terminal wireless device. While IMSI is subscriber-related, the IMEI

is equipment-related. Specific for a certain mobile terminal (telephone, modem or GSM module of the MobiLink).

IMSI - Acronym for International Mobile Subscriber Identity. Unique code number (for the entire world) that identifies a GSM subscriber to the network. Linked to the user account information at the network operator. IMSI resides in the SIM card, thus when you change the subscriber card on your TOPEX ISDN gateway, you will have different IMSI codes, which are displayed by the OAM program.

ISDN - Acronym for **I**ntegrated **S**ervices **D**igital **N**etwork.

Worldwide digital network providing high-speed connection between the terminal devices (telephone, fax machines, computers) for a wide range of telecommunication services, using the existing telephony infrastructure. TOPEX ISDN gateway interfaces an ISDN-BRI connection (two B voice channel + one D data channel) to one or two mobile networks.

ISDN Connection Type - The interfaces of TOPEX ISDN gateway may work either in "Point-to-point" mode or in "Point-to-Multipoint" mode. You should select this according to the type of the equipment (digital PBX or telephone) that TOPEX ISDN gateway is connected to. The Point-to-Point is used to connect only two devices, and it uses the DDI service (Direct Dialing In). You should use this in the most usual case, when TOPEX ISDN gateway is connected to an ISDN telephone exchange. But when you have the TOPEX ISDN gateway unit connected to one or several ISDN phones or modems, you can no longer use the Point-to-Point. Instead, you must use the option "Point-to-Multipoint", which allows you to connect several ISDN equipments (from two up to eight). Instead of DDI, it uses the MSN service (Multiple Subscriber Number). The "Point-to-Multipoint" connection should be used for ISDN phones or other ISDN terminals.

NT - Acronym for Network Termination Mode of operation: in this case, the ISDN device is operated as a network terminal (NT), meaning that both the electrical and physical parameters (Layer 1) are adapted as well as accepting the data link service and addressing tasks for Layers 2 and 3. TOPEX ISDN gateway provides one NT port.

PBX - Acronym for Private Branch eXchange. The PBX is a small, private version of the larger central switching office of the phone company. A PBX is a **private** telephone switch. It is connected to groups of lines (junctions) from one or more central offices and to all of the telephones at the location (subscribers, extensions) served by the PBX. Current exchanges are in fact PABX, automated PBX, which don't require a human operator to route the calls. TOPEX ISDN gateway was designed to work together with an ISDN type (digital) Phone Exchange to route the calls, although it can perform by itself advanced routing of calls.

Physical layer: Layer 1 in the Open Systems Interconnection model. OSI is a standard description or "reference model" for how messages are transmitted in a telecommunication network. Layer 1 is the physical level, which conveys the bit stream through the network at the electrical and mechanical level. TOPEX ISDN gateway has a feature that allows you to deactivate (disable) the physical Layer of the ISDN connection when there are no calls.

PP - Acronym for Point - to Point, direct communication between two "points" in a network. The two devices communicate only with each other. The point-to-point connection is a variant of the wiring of the S0 interface, if only one terminal is available.

PMP - Acronym for Point-to-Multipoint. The other variant of the configuration for the S0 bus, when several terminals (up to eight) can be connected to the same connection. Out of these maximum, at any moment of time two can establish a connection.

PSTN - Acronym for **P**ublic **S**witched **T**elephone **N**etwork (**s**).

It is the classic international fixed telephony system based on copper wires that carry voice and data. Analog (mostly) or digital technology is used to provide voice grade services for the users

that access that network via an **analog** interface. As its name suggests, TOPEX ISDN gateway was designed to work with **digital** (ISDN) fixed public telephony networks.

SIM - Subscriber Identity Module, the subscriber card you use in your telephone or in the GSM modules of MobiLink.

SMS - Acronym for **Short Message Service**; means the transmission of short text messages to and from cellular phones. The messages must be text only (no images or graphics) and not longer than 160 alpha-numeric characters. Operators of Mobile Phone Networks use a spare data channel to send SMS messages. You may send SMS's to another mobile subscriber, the mobile operator can send you phone settings over-the-air or commercial companies may send dedicated content to your mobile terminal. Also, a special **additional program** implements the SMS2MAIL and MAIL2SMS functions for automatic conversion (both ways) between e-mail and SMS messages.

SMSC - Acronym for Short Message Service Centre, the telephone number of the service center to be used for text messages. You must set this number properly, since it is specific to each mobile operator (carrier).

TA - Terminal Adapter. The terminal adapters operate adaptation between ISDN interfaces and standard terminals. When you connect a Terminating Equipment (phone, digital fax machine) to ISDN, it must be an ISDN-compatible device (TE-1). Other devices, for example a computer, are called TE-2 and must be connected to ISDN via a Terminal Adapter. If you want to connect analog phones to TOPEX ISDN GATEWAY you must use such a terminal adapter.

TE - Acronym for Terminal Equipment Mode. In this case the ISDN device is operated at the TC system like a TE2 device, that is like a terminal which is compatible with ISDN specs. TOPEX ISDN gateway features one TE port. The NT and TE ports may be used at the same time.

TEI Management - Acronym for "Terminal Equipment Identification". This is an internal ISDN identification of connected phones. TOPEX ISDN gateway lets you set the TEI management either on "0" or on "auto", depending upon the type of ISDN connection used. For the Point-to-point connection (default), a value of "zero" must be used for TEI. If you change the connection type "Point-to-multipoint", TEI Management field switches to "Auto", which is the value that must be used in case of point-to-multipoint connection (up to eight ISDN devices connected to the same interface).

Timer Call - timer for the dialing of the number. Programmable time interval during which TOPEX ISDN gateway waits for the digits of the phone number to be dialed.

Timer Callback - timer used to implement the callback service. Establishes the mode of operation. When you set a "normal" value (6-12 seconds), this is a time threshold to discriminate between callback operation and ordinary calls. If the calling party whose identity is found the CLIP table (with the callback option) drops the call in a time interval less than "Timer Callback", then TOPEX ISDN gateway will call back the calling party. However, if the same calling party does not end the call before the "Timer Callback" seconds expires, no callback action will be performed, and the call will get in directly. When you set a zero value here, incoming calls are immediately rejected and the user in the field is called back by the ISDN-2-GSM gateway.

The manufacturer reserves the right to modify the product and manual for the purpose of technical improvement without prior notice. The manufacturer guarantees the good functioning of the product provided that it has been correctly installed and the directives for storage and usage have been respected. The warranty implies exclusively repairing or replacing the defective unit. The warranty does not include any indirect losses or loss of profit. The manufacturer is not liable for any damage, whether direct, indirect, special, incidental, or consequential, as a result of using **TOPEX ISDN gateway**.

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We certify hereby that the **TOPEX ISDN GATEWAY** unit is manufactured in concordance with the legal provisions concerning responsibility towards the quality of delivered products, fulfills the quality parameters specified in its "User's manual" and is fit for the purpose for which it has been designed. We also warrant that the equipment will perform substantially in accordance with the accompanying documentation.

Any comments, suggestions and proposals of yours concerning our products are welcome and we are gladly waiting for your feedback at the following address.

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